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ELDER JOHN LELAND AND THE MAMMOTH CHESHIRE CHEESE

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The presentation of a mammoth cheese to President Thomas Jefferson at the White House on New Year's Day 1802 was a spectacular episode.[1] Although a very insignificant affair as compared with the Louisiana Purchase, the Embargo Act, and other great national events of Jefferson's administration it aroused a vast amount of publicity at the time. The Elder John Leland who originated the idea of the presentation and supervised its execution was a unique personality, and his career is related to that of Jefferson in a number of ways.[2]

Leland was born on May 14, 1754, at Grafton, Massachusetts, a few miles from the city of Worcester. Although baptized as a child, it was not until the summer of 1772 when he heard a voice in the sky saying "you are not about the work which you have got to do" that he began to reflect on what were then deemed the more serious things of life. He attended and then ventured to address religious meetings, and as his audiences seemed to appreciate his efforts he commenced to preach when requested before small congregations in surrounding towns.

Beginning in October 1775, Leland spent eight months preaching in Virginia where he found the prospects attractive. After returning to Massachusetts to be married, he preached his way back to Virginia and located near Culpeper where he was ordained in August 1777. Already, however, he had begun to acquire a state-wide reputation for his vigorous, anecdotal, and somewhat eccentric manner of preaching.

Theological subtleties were of little concern to Leland. He was far more interested in the simple teachings of the Golden Rule and in the duties of good citizenship. He was an ardent patriot throughout the Revolution and a firm supporter of the principles that Jefferson wrote into the Declaration of Independence. When Jefferson returned to the Virginia legislature in October 1776 and began his important work on the revision of Virginia's laws, Leland became one of the staunchest advocates of the proposed reforms. He supported especially the measure to relieve the people of Virginia from the burden of supporting an established church and in his long circuit rides through the State injected into his sermons remarks on the injustice of being taxed for such a purpose.[3]

In 1778 Leland moved his residence from Culpeper to Orange County not far from Jefferson's Monticello. It has been stated that a strong friendship was then formed between the two men, and no doubt they did meet occasionally, although Jefferson was absent in France for a considerable part of Leland's residence in Orange County. Leland's influence was a great factor in winning the rank and file of Virginia's population to the support of Jefferson's bill for the complete separation of church and state, and some of Leland's admirers have acclaimed him as the leader who really overthrew the principle of a state-supported

[1] This article is a redaction of a lecture with the same title presented at the Cosmos Club, Washington, D. C., Nov. 22, 1943.

[2] Information regarding Leland is found in the following sources: His autobiography, letters, and sketches in *The Writings of the Late Elder John Leland, including Some Events in His Life, Written by Himself, with Additional Sketches, &c.*, by Miss L. H. Greene (New York, 1845), hereafter cited as *Writings*; Mrs. F. F. Petitcler, "Recollections of Elder Leland," Berkshire Historical and Scientific Society, *Berkshire Book*, 271–290 (Pittsfield, Mass., 1892); J. T. Smith, "Life and Times of the Rev. John Leland," *Baptist Quarterly*, 5:230–256 (1871); and Herbert M. Morais, "Leland, John," *Dictionary of American Biography*, 11:160–161 (New York, 1933).

For the story of the Cheshire cheese, see Ellen M. Raynor and Emma L. Petitclerc, *History of the Town of Cheshire, Berkshire County, Mass.*, 85–88 (Holyoke, Mass., 1885). Much traditional information about Leland and the cheese is given in *The Berkshire Hills, A Historic Monthly*, published by W. H. Phillips at Pittsfield, especially the numbers for January, February, March, May, October, November, December 1901.

[3] Samuel Chiles Mitchell, "James Madison and His Co-worker, John Leland," *Religious Herald*, 107(42): 4–5 (Oct. 18, 1934).

religious denomination in the United States. Leland himself, however, never made any such claim. Speaking on this point at Lanesborough, Massachusetts, on February 10, 1829, he explicitly stated: "In the United States, the felonious principle has been apprehended, tried, condemned and executed. Roger Williams and William Penn first attacked the villain, and Thomas Jefferson did more than any one man to bring him to the stake."[4]

After fourteen years of residence in Virginia, Leland, prompted by his apparently inborn wanderlust, returned with his wife and eight children to Massachusetts. He finally settled in February 1792 at Cheshire, a small farming community inhabited almost wholly by Baptist people who had migrated from Rhode Island to found homes on hitherto unsettled land in western Massachusetts. Here, near the foothills of Mount Greylock, the highest peak in Massachusetts, the Elder made his home for most of the remaining forty-nine years of his life. However, his spiritual ministrations were never confined, either in Virginia or Massachusetts, to the place where his family lived. Cheshire was the main scene of his activities, but whenever he felt the urge, he saddled his horse and started on a long circuit ride, over the hills and far away, preaching his way from town to town.

In Massachusetts, as in Virginia, Leland interspersed his ministerial exhortations with pleas for the complete emancipation of religion from politics. He denounced most vigorously the New England practice of determining the ministers of a community by a majority vote and then of taxing all citizens of the community, irrespective of their religious beliefs, for the support of such ministers, who were nearly always Congregationalists. In this and in other respects Leland was a staunch supporter of the democratic principles of his Virginia friend, Thomas Jefferson, whom he called the patriarch of liberty, the man of the people, the defender of the rights of man and the rights of conscience, and the greatest statesman that the world had ever produced. As a strong Jeffersonian he was bitterly opposed to the aristocratic Tory tendency of the old Federalist party which was more strongly entrenched in Massachusetts than in any other State of the Republic. Leland used all his influence to promote the election of Jefferson in the bitter campaign of 1800, and his persuasive picturesque oratory no doubt won many votes for his candidate. He did much also to free Jefferson's name from the charges of dishonesty and immorality that had been heaped upon him by many of his political opponents. There is, in fact, a tradition that Leland had converted Cheshire so thoroughly to Jeffersonian principles that when a ballot for a Federalist candidate was discovered among the votes which the township once polled its presence was considered to have been possible only as the result of a mistake and it was forthwith rejected as invalid.

When the news that the House of Representatives had settled the tie electoral vote of Jefferson and Burr in favor of the former reached Cheshire some days later, the jubilation of its citizens knew no bounds. On April 9 following Jefferson's inauguration Elder Leland delivered before his fellow citizens a fast-day sermon, entitled "A Blow at the Root," in which for over an hour he again denounced the practices in Massachusetts of taxing people to hire preachers and build churches and of intermixing ministerial and town taxes so that the citizens might be ignorant of the assessment. He held up as an example the complete disestablishment of the church which had been achieved in Virginia under the leadership of the great man who had just been elected President. He then concluded:

> Pardon me, my hearers, if I am over-warm. I lived in Virginia fourteen years. The beneficent influence of my hero was too generally felt to leave me a stoic. What may we not expect, under the auspices of heaven, while JEFFERSON presides, with *Madison* in state by his side. Now the greatest orbit in America is occupied by its brightest orb: but, sirs, expect to see religious bigots, like cashiered officers, and displaced statesmen, growl and gnaw at their galling bands, and, like a yelping mastiff, bark at the moon whose rising they cannot prevent.[5]

In a companion political broadside of this same time entitled "A Stroke at the Branch," Leland, after attacking the Federalist party and the previous administration of John Adams, foretold what might be expected under the presidency of Jefferson.

Leland, helping as he did by sermon and broadside to promote the general acceptance of Jeffersonian principles, conceived a more spectacular plan of celebrating his hero's election to the Presi-

[4] *Writings*, 553.

[5] *Ibid.*, 255.

dency—a plan, moreover, that would bring Cheshire's chief agricultural commodity to the attention of the Nation more widely and more permanently then could be attained by any of the common methods of advertising. This brilliant project involved the collection of the curds obtained from the milk of every cow within the precincts of Cheshire upon a specified day and the pressing of these curds into a mammoth cheese which after proper curing was to be conveyed to Washington for presentation to President Jefferson on the next New Year's Day as a token of appreciation and congratulation from the farmers and housewives of Cheshire. This plan, announced by the Elder from his pulpit, was approved enthusiastically by Cheshire's entire population, and July 20, 1801 was selected as the date for the pressing of the cheese. The cows of Federalists were excluded from participation in this event.

Many advance preparations were required for carrying out this design. A census had to be taken of the cow population of Cheshire and of the quantity of curds that might be expected from their milk on the date specified. When this had been determined, it was necessary to calculate the size of the hoop in which to press the estimated amount of curds. Directions had to be given to housewives respecting the preparation of the curds in order to secure the highest degree of uniformity and the necessary protection in the home and during transportation against contamination, especially from insects. The farm of Elisha Brown, Jr., which was centrally located and where there was a large cider press, was selected as the place of manufacture. Elisha's nephew, Darius Brown, the engineering genius of Cheshire, attended to all the mechanical details and looked after the construction of the huge cheese hoop, 4 feet in diameter and 18 inches deep, which were the dimensions calculated by him for holding the pressed curds from the milk of Cheshire's cows for a single day's milking. To surmount this immense hoop, which was strengthened with iron bands, a detachable rim or flange was, no doubt, constructed for holding the heaped up curds as they were being pressed constantly down into the hoop.

On the appointed July 20, which was a holiday for Cheshire, the whole farming population of the township proceeded on foot, horseback, or in conveyance to the farm of Elisha Brown, Jr., where their contributions of curds, after careful inspection by the ladies in charge, were seasoned with salt and spicy herbs, thoroughly mixed to secure uniformity of texture, and then emptied into the large hoop with its lining of cheesecloth. After repeated squeezings to fill the hoop to its utmost capacity, the ponderous screw of the press was turned down. As the escaping whey gushed out in foaming streams, the Elder rose and, invoking a blessing, dedicated the cheese to the honor and fame of the country's illustrious President, Thomas Jefferson. A hymn was then sung which the Elder lined out to the tune of Mear.

After remaining eleven days in the press, the big cheese was removed and taken to the dairy house of Captain Daniel Brown, brother of Elisha and father of Darius, in Cheshire village. In celebration of the successful outcome of the undertaking a feast was provided by Moses and Freelove Wolcott in Cheshire Tavern, next door. On August 20, one month after pressing, the cheese weighed 1,235 pounds; there is no record of any subsequent weighing.

Some writers on the subject have specified 1,450 pounds as the weight of the cheese, but this figure is perhaps a confusion of the total amount of cheese made on July 20 with that contained in the big cheese alone.[6] The hoop designed for the occasion was not large enough to hold all the pressed curds, and so three additional cheeses of 70 pounds each, or a total of 210 pounds extra, were made. This amount, added to the 1,235 pounds that the big cheese weighed, gives a total of 1,445 pounds. The weight of the cider-mill screw that was used for pressing the cheese was also stated to have been 1,450 pounds, and this coincidence may have been an additional cause of confusion over the weight of the big cheese.[7]

Of the contemporary accounts concerning the mammoth cheese, the most entertaining was published in the *Hampshire Gazette* of Northampton,

[6] [David Dudley Field], *A History of the County of Berkshire, Massachusetts*, 393 (Pittsfield, 1829), states that "three additional cheeses were made, weighing 70 pounds each. The mammoth cheese weighed about 1450 lbs." Josiah Gilbert Holland, *History of Western Massachusetts*, 2:478 (Springfield, 1855), makes a similar statement, no doubt following Field.

[7] *Berkshire Hills*, Nov. 1, 1901, states: "Nearly forty years ago the late E. D. Foster presented the Berkshire Athenaeum with a section of the ponderous iron cider mill screw which originally weighed 1,450 pounds and which was used in the building of the famous Leland cheese."

Massachusetts, for September 30, 1801. Owing to the old custom of naming people after Old Testament celebrities, the writer of this sketch couched his description in Biblical language. Leland appears with the name Jacknips, a pseudonym used by him in some of his writings. The Hillites were the people living on or near Stafford Hill, and the Jacobites were the Democrats or followers of Jefferson.

The GREAT CHEESE.

And Jacknips said unto the Cheshireites, behold the Lord hath put in a Ruler over us, who is a man after our own hearts.

Now, let us gather together our Curd, and carry it into the valley of Elisha, unto his wine press, and there make a Great Cheese, that we may offer a thank offering unto that great man.

Now these sayings pleased the Cheshireites, so they did according as Jacknips had commanded.

And they said unto Darias [*sic*] the son of Daniel the prophet, make us a great hoop, four feet diameter and 18 inches high, and Darius did as he was commanded, and Asahel and Benjamin, the Blacksmiths secured it with strong iron bands, so that it could not give way.

Now the time for making this great Cheese was on the 20th day of the seventh month, when all the Jacobites assembled as one man, every man with his curd, except John the Physician, who said,

I have no curd, but I will doctor the Federalists, send them to me and I will cure their fedism.

And Jacknips said, behold Frances the wife of John the Hillite,[8] she is a goodly woman, and is wont to make good cheese, now she shall be chief among the women.

Now when all things were ready, they put it in Elisha's press—ten days did they press it, but on the eleventh, Jacknips said unto the Cheshireites—behold now let us gather together a great multitude and move it to the great house of Daniel the prophet, there to be turned and dried.

Now Daniel lives about eight furlongs from the valley of Elisha.

So they made a great parade and mounted the great cheese on a sled, and put six horses to draw it.*

And Jacknips went forward, and when he came to the inn of little Moses, he said unto Moses, behold the great cheese is coming.

And Moses said unto Freelove his wife, behold the multitude advancing—now let us kill all the first born of the lambs and he-goats, and make a great feast.

And they did so, and the people did eat meat and drink wine, the fourth part of an hin each,[9] so they were very merry.

And Jacknips said, it shall come to pass, when your children shall say unto you, what mean you by this great cheese, that ye shall answer them, saying,

It is a sacrifice unto our great ruler, because he giveth gifts unto the jacobites, and takes them from the federalists.

And Jacknips said, peradventure within two years I shall present this great cheese as a thank offering unto our great ruler—and all the Cheshireites shall say Amen.

**The weight of the Cheese at 15 days old was ONE THOUSAND TWO HUNDRED AND THIRTY FIVE.*

History is silent as to the number of cows whose milk was used in making the famous cheese, and there are no contemporary census figures that assist in making an estimate. Dr. Asa Burbank, who has been called the poet laureate of Berkshire County at this time, wrote an account of the episode in verse which began:

> From meadows rich with clover red
> A thousand heifers come.[10]

The number "a thousand" might be dismissed as mere poetic license, but a comparative estimate shows that the entire bovine population of the town in 1801 probably exceeded one thousand cows by a considerable figure. According to the Census of 1800, the human population of Cheshire was 1,325 and the number of dwellings 186. Even those who resided in the little village of Cheshire and in the outlying community of Stafford Hill usually kept one or more cows. Leland, writing in December 1830 from the adjoining town of New Ashford to which he had moved in 1815, recorded: "My wife is seventy-seven years old, and has this season done the housework, and from six cows has made eighteen hundred pounds of cheese, and two hundred and fifty pounds of butter."[11] The large farms of Cheshire, of which there were many, no doubt kept 20 or more cows each, but taking Leland's herd as an average the 186 householders of Cheshire would have had 1,116 cows. The earliest census having data on the milk cows of Cheshire is that for 1850 which gives the number three years old and up as 1,112. However, the

[8] Frances Wells, wife of John Wells, Jr., whose farm was adjacent to that of Elisha Brown, had general inspection of the cheese-making operations.

[9] An ancient Hebrew measure equivalent to 1.6 gallon.

[10] For the complete text, see *Berkshire Hills*, February 1901.

[11] *Writings*, 602.

number of 1801 was probably somewhat larger as Cheshire was then practically at its peak in output of dairy products. The thin soil of the hillside fields was approaching exhaustion, and the farming population soon began to move elsewhere.

Possibly the amount of cheese made at the time of the ceremony throws some light on this problem. As about 10 pounds of milk are required to make 1 pound of cheese, a total of about 14,450 pounds of milk would be required to make 1,445 pounds of cheese. If the average cow of Cheshire in July 1801 gave only 14.5 pounds of milk a day, then Burbank's reference to "a thousand heifers" is about right. A 12-pound average daily production would necessitate 1,200 cows. If the present July average of 20 pounds per day is taken as the basis of calculation, the number of cows required to supply the curds for the cheese would be about 725, which is probably too low an estimate since the dairy stock of 1801 as regards milk production was below that of the better cows of today. Since so little is known about the dairy stock of Cheshire at the time and whether or not farmers beyond the limits of Cheshire contributed any curds, it is idle to speculate farther upon this point.

There is no record of the final dimensions of the great cheese, and it is only possible to arrive at an estimate. Well-pressed cheddar cheese of 1.1 specific gravity would weight 68.75 pounds per cubic foot so that a cheese hoop of 18.85 cubic-feet capacity could contain 1,296 pounds if completely filled with pressed cheese. The ratio of this to the actual weight of 1,235 pounds indicates a compression of 17.96 cubic feet which would be equivalent to a cheese 4 feet in diameter and a little over 17 inches thick.[12]

When snow came in early December, the mammoth cheese was placed on a sled and hauled to Hudson, New York, for shipment by boat to New York City where it was removed and taken to Washington. Leland had been appointed to make the presentation of the cheese to President Jefferson, and the accounts of the journey to Washington vary somewhat in detail.

According to one account, Leland, with his companion Darius Brown, went to New York by stage, leaving the cheese on a horsedrawn sled to the care of an eccentric teamster named Fred Dunham. The Elder, in accordance with his circuit-riding habit, preached his way along, both to and from Washington, and being a well-known celebrity had no difficulty in obtaining good audiences and finding lodgings at every stopping place. It was on this trip, because of his having the mammoth cheese in charge, that he acquired the sobriquet, the Mammoth Preacher.

Another account states that the cheese continued its journey beyond New York by water either to Baltimore or Washington. The late George P. Lawrence, a well-known wit who represented the northern Berkshire district in Congress from 1897 to 1913, once remarked that when the cheese reached Baltimore it was strong enough to walk the remaining distance to Washington. In any case, a note in the *National Intelligencer and Washington Advertiser* for December 30, 1801, states: "Yesterday the cheese, made in Massachusetts to be presented to the President, was brought to the city in a wagon drawn by six horses."

According to one of the accounts, Fred Dunham the teamster expressed doubt about the propriety of making the presentation on New Year's Day. While Leland went to determine this, Dunham, without waiting, drove to the White House where he actually secured an audience with President Jefferson. "Say," he began, "there's a whopping big cheese come from Cheshire. Knowing it might be a surprise I came to prepare you." When Jefferson asked his name, the teamster replied: "Frederick Dunham at your service. I brought down the cheese myself. No small job but I did it. It's a likely cheese and brought by a likely man, if I do say so." The story goes that the President told about the morning call from the eccentric teamster with much gusto when Leland made the actual presentation in the East Room of the White House.[13]

In making the presentation, Leland first submitted the following address of felicitation from a committee of five prominent citizens of Cheshire.

To Thomas Jefferson, President of the United States of America.

Sir:

Notwithstanding we live remote from the seat of our national government in an extreme part of our own state, yet we humbly claim the right of judging for ourselves.

Our attachment to the National Constitution is indissoluble. We consider it is a description of those

[12] O. E. Reed, chief of the U. S. Bureau of Dairy Industry, kindly supplied data for these estimates.

[13] The Dunham episode is probably in large part one of the later legendary narrations that embellish the story of the Cheshire cheese.

powers which the people have delegated to their Magistrates to be exercised for definite purposes, and not as a charter of favors granted by a sovereign to his subjects.

Among its beautiful features—the right of free suffrage to correct abuses, the prohibition of religious tests to prevent all hierarchy, and the means of amendment which it contains within itself to remove defects as fast as they are discovered, appear the most prominent.

Such being the sentiments which we entertain, our joy must have been exquisite on your appointment to the first office in the nation.

The trust is great, the task arduous. But we believe the supreme Ruler of the Universe who raises up men to achievements has raised up a *Jefferson* at this critical day to defend *Republicanism* and to baffle the arts of *Aristocracy*. We wish to prove the love we bear to our President, not by words alone but in *deed and in truth*. With this address we send you a cheese by the hands of Messrs John Leland and Darius Brown, as a token of the esteem we bear to our chief Magistrate and of the sense we entertain of the singular blessings that have been derived from the numerous services you have rendered to mankind in general and more especially to this favored nation, over which you preside. It is not the last stone of the Bastile, nor is it an article of great pecuniary worth, but as a freewill offering we hope it will be favorably received.

The cheese was produced by the personal labor of *Freeborn Farmers* with the voluntary and cheerful aid of their wives and daughters without the assistance of a single slave. It was originally intended for an elective President of a free people, and with a principal view of casting a mite into the even scale of *Federal Democracy*.

We hope it will safely arrive at its destined place, and that its quality will prove to be such as may not disappoint the wishes of those who made it.

To that Infinite Being who governs the Universe we ardently pray that your life and health may long be preserved—that your usefulness may be still continued—that your administration may be no less pleasant to yourself than it is grateful to us and to the nation at large that the blessing of generations yet unborn may come upon you.

In behalf of ourselves and our fellow citizens of Cheshire, we send you the tribute of profound respect. . . .[14]

To this committee Jefferson afterward sent the following message of appreciation.

To Messrs. Daniel Brown, Hezekiah Mason, Jonathan Richardson, John Waterman and John Wells junr. a committee of the town of Cheshire in Massachusets. Gentlemen

I concur with you in the sentiments expressed in your kind address on behalf of the inhabitants of the town of Cheshire, that the constitution of the United States is a charter of authorities and duties, not a charter of rights to it's officers; and that among it's most precious provisions are the right of suffrage, the prohibition of religious tests, and it's means of peaceable amendment. nothing ensures the duration of this fair fabric of government so effectually as the due sense entertained, by the body of our citizens, of the value of these principles, & their care to preserve them.

I receive, with particular pleasure, the testimony of good will with which your citizens have been pleased to charge you. it presents an extraordinary proof of the skill with which those domestic arts, which contribute so much to our daily comfort, are practised by them, and particularly by that portion of them most interesting to the affections, the cares & the happiness of man.

To myself this mark of esteem from freeborn farmers, employed personally in the useful labors of life, is peculiarly grateful. having no wish but to preserve to them the fruits of their labour, their sense of this truth will be my highest reward.

I pray you, gentlemen, to make my thanks for their favor acceptable to them, & to be assured yourselves of my high respect and esteem.

Th. Jefferson[15]

Leland, in his own remarks to the President, spoke of the loyalty of the people of Cheshire to Jefferson's principles of democracy and said that the cheese, a product of home manufacture to which every patriotic family and cow in Cheshire had contributed, was a token of their faithful adherence to his administration.

In reply the President stated that he looked upon this New Year's gift as a token of the fidelity of the people of the country to the great cause of equal rights to all men, that he would cause the event to be placed upon the archives of the Nation, and that he would ever esteem it as one of the happiest occasions of his life. Then, turning to the Elder, he continued:

And, now, my reverend most respected friend, I will with the consent and in the presence of my cabinet officers, proceed to have this monster cut, and you will take back to your Berkshire home a portion of it, that your people may test its richness, flavor and quality.

[14] This address bears all the earmarks of having been composed by Leland. Two copies were made. The signed copy was sent with the cheese to Jefferson. The unsigned copy and Jefferson's letter of reply, retained at first by Daniel Brown, the chairman of the committee, passed to his son, Darius Brown, then to the latter's descendent Mrs. Bucklin, and finally to the writer's brother, William B. Browne of North Adams, Mass., to whom acknowledgment is made for the loan of the documents and for various facts of local Cheshire history.

[15] *Ibid.*

and you will convey to them my heartiest thanks. Tell them never to falter in the principles which they have so nobly defended, having bravely and successfully come to the rescue of our beloved country in the time of its deepest and greatest peril. I wish them health and prosperity, and that rivers of milk may never cease to abundantly flow in to not only themselves but their posterity.[16]

The ceremony of cutting and serving the historic cheese, which immediately followed Jefferson's remarks, has been thus described in the same story:

The steward of the White House then, on a signal from the president, advanced with a huge and glittering knife and carved the monster cheese in the presence of the president and cabinet, foreign diplomats and many distinguished men and women of ancient note. Its color was a beautiful annotto [*sic*], somewhat varigated [*sic*] in shade owing to the mixture of so many different curds, and it was the object of the greatest curiosity. Great slices were served up with bread to the president, cabinet, diplomatic representatives in the order of their rank and station, and to others, until all had been feasted. Elder Leland was then introduced, person, by person by the president, to the entire gathering.

The news of this unique event spread rapidly. The Library of Congress has a manuscript letter written by Nelly Custis on January 3, 1802 to her friend, Mrs. Mary Pinckney of Charleston, South Carolina, in which she remarked:

You have no doubt heard of the famous mammoth cheese which the kind ladies of Cheshire thought proper to present our ruler with. It has arrived without accident at the President's house who has appropriated a room to it which he dignifies with the appellation of mammoth room and invites the members of Congress to visit it. A number of Federalists were here yesterday who had seen it. They say the crust is painted red and think that the new representation room looks like an oven intended for the apple pie, which it was supposed would be offered with the cheese.

A letter by a certain Benjamin Robinson of Bennington, Vermont, written on January 1, 1802, the day of the presentation, includes the following passage:

The great cheese arrived last night and this morning was presented to President Jefferson as a New Year's gift. It has received no injury on the way and appears in excellent state for its age. If I can judge from Mr. Jefferson's countenance he is highly diverted with the present curiosity, as all alive people are flocking in from all quarters to see the New England mammoth.[17]

Leland's homeward journey resembled a triumphant march. There was, of course, a goodly amount of banter amid the congratulations that were showered upon him. A Federalist is said to have asked: "Is it true, Elder, that President Jefferson found some skippers in the mammoth cheese when he cut it?" The Elder, who was a match for anyone at repartee, replied: "It is quite possible, for although we tried to exclude all Federalists we learned afterwards that one or two of them got by us and some of their curds may have contaminated the cheese."

On the Sunday following his arrival home, the Cheshire Baptist church was filled to capacity with people who came to hear the Elder's personal account of his journey and of the presentation of their cheese to President Jefferson. He so overflowed with praise for his great hero that he was lost for a moment in trying to think of something with which to compare him. The sight of a very corpulent old lady, sitting directly in front, soon gave him, however, the desired inspiration. With a great outburst of eloquence, he exclaimed: "Thomas Jefferson not only completely fills the presidential chair but like Polly Smith slops over all around it."[18]

After the famous cheese episode, there is no record of further personal relations between Leland and Jefferson, although they may have met again when the Elder made another circuit ride into Virginia twelve years later. In a fragmentary sketch of his life, he said to this trip:

In December, 1813, I started again for Virginia; and preaching on the way to Washington, I crossed the Potomac into Virginia the last day of January, 1814. I was in the state eighty days, in which time I travelled seven hundred miles, and preached more than seventy times. I never had before—I never have since—nor do I ever expect to preach to as many people in so short a time. The kindness of the people to their old friend, whom they had not seen for sixteen years, was un-

[16] *Berkshire Hills*, February 1901. As no current record was made, Jefferson's response, the accounts of the carving, and other details belong to the traditional stories about the cheese; *e.g.*, "Reminiscences of Cheshire," in the North Adams, Mass., *News and Transcript*, Apr. 21, 1864.

[17] This letter was among the papers of the late C. Q. Richmond of North Adams, Mass. The extract is from a newspaper copy of the original.

[18] *Berkshire Hills*, February 1901.

bounded.... I arrived at home in June, after an absence of six months; having travelled in that time eighteen hundred miles, and preached about one hundred and fifty times.[19]

As a circuit rider the Elder seems to have preached a sermon about every 10 miles. It made no difference about the day, the time, the place, or the occasion. He was always ready to talk, and the people were ready to listen. He was very statistically minded. Writing in 1820, he stated:

Since I began to preach in 1774, I have travelled distances, which, together, would form a girdle nearly sufficient to go round the terraqueous globe three times. The number of sermons which I have preached, is not far from eight thousand. The number of persons that I have baptised is one thousand two hundred and seventy-eight. The number of Baptist ministers whom I have personally known is nine hundred and sixty-two. Those of them whom I have heard preach, in number, make three hundred and three. Those who have died, (whose deaths I have heard of,) amount to three hundred. The number that have visited me at my house is two hundred and seven. The pamphlets which I have written, that have been published, are about thirty.[20]

In January 1825, he wrote:

I have preached in four hundred and thirty-six meeting-houses, thirty-seven court-houses, several capitols, many academies and school-houses; barns, tobacco-houses and dwelling-houses: and many hundreds of times on stages in the open air. Not the place, but the presence of Christ, and a right temper of mind, makes preaching solemnly easy and profitable. My congregations have consisted of from five hearers to ten thousand.[21]

Without knowing it Elder Leland probably recorded among these statistics a few world records. His audiences were made up of the old and the young in all stations of life. In a sermon preached on his seventieth birthday he related: "I have had the honor, (if honor it may be called,) of preaching to two or three presidents of the United States, either while in, or when out of office; to a number of governors, one Indian King, etc., but the poorer sort of people have been the most constant attendants on my ministry."[22] Jefferson, Madison, and Van Buren may have been the presidents referred to in this passage. In his first Virginia period he was very intimate with Madison, and Van Buren, whenever he happened to be in the Berkshire country, always visited Leland's home.[23]

The great appeal of Leland as a preacher was due to his avoidance of theological and doctrinal matters in his sermons, to his wonderful fund of entertaining anecdotes, to his unfailing wit and good humor, and to his native eloquence which on occasions could reach the highest levels of oratory. He was an ardent patriot and was much sought after as a Fourth of July speaker. In sermon and speech he laid emphasis on the rights of the people rather than on matters of creed or doctrine. In this connection on his eightieth birthday he asserted: "I have never labored hard to support the CREED of any religious society; but have felt greatly interested that all of them should have their RIGHTS secured to them beyond the reach of tyrants."[24]

In his battle for emancipation from unjust religious laws Leland was elected in 1811 to the Massachusetts House of Representatives where he made a most vigorous speech on the subject of religious freedom. It was many years, however, before his contention that "Government should be so fixed, that Pagans, Turks, Jews and Christians should be equally protected in their rights" became an established law of the State.[25] Leland's fight against coercive sabbatical laws that would prevent travel and movements of the mail on Sundays was equally strong.

In his relation to the men and events of the early formative period of American history, Elder John Leland may be described not only as a famous religious leader but as a great public character. His long circuit rides over a period of sixty years made him a familiar figure to thousands of people along the Atlantic seaboard between Maine and the Carolinas. His name was a household word in nearly every home. When he died in 1841 at the venerable age of 86 years and 8 months his passing was lamented both in the North and South as a great national loss. Innumerable stories about his picturesque personality began

[19] *Writings*, 34.
[20] *Ibid.*, 35.
[21] *Ibid.*
[22] *Ibid.*, 513.
[23] For Leland's relations with Van Buren, see *Berkshire Hills*, February 1901.
[24] *Writings*, 39.
[25] *Ibid.*, 358.

to circulate and multiply, and thus the figure of a new legendary Elder Leland, about whom much might be said, began slowly to emerge.

Elder Leland in vigorous manhood was described as being not far from 6 feet in height, but as years advanced his erect spare figure became more stooping. He was buried in the little village cemetery of Cheshire where his grave is marked by a simple obelisk of blue marble with the following inscription which he himself had composed: "Here lies the body of the Rev. JOHN LELAND, of Cheshire, who labored 67 years to promote piety and vindicate the civil and religious rights of all men."

VERGIL AND CONSERVATION

LOIS OLSON

If Cato was the Censor of Roman farmers, Vergil (70-19 B.C.) was their Psalmist.[1] Where Cato goaded them to labor in the fields, Vergil led and encouraged them. Although he fully appreciated the hard work required of farmers and the dangers of crop failure resulting from plant diseases and climatic hazards, he found no aspect of farm life too humble or too prosaic for poetic treatment. No one in all Roman history was more respected or more loved by his fellow men than Vergil. When his *Georgics* were recited in public, the audience with one accord rose to its feet. When the poet himself entered the house, he was saluted with a reverence like that paid to Augustus Caesar.

Possibly no book on farming ever written has had more influence, directly or indirectly, on world agriculture than Vergil's *Georgics*, a series of four poems dealing with the various aspects of farm life. In his own time, they were read and memorized by school children as well as adults. Those of following generations who wrote on agriculture quoted and copied Vergil but always acknowledged him as their master. His works were discussed in the monasteries of Europe and quoted by outstanding leaders, including Augustine and Jerome. Throughout the Middle Ages, ardent churchmen often condemned Vergil as a pagan but honored him by emulating him. Like Dante, they grieved because the most Christlike of all pagans lived too early to be a Christian.

Vergil and Cato were both intensely patriotic—proud of Rome's past and zealous for her future. Vergil, however, was all the more ardent because he belonged to a first generation of Roman citizens. He was born in 70 B.C. of yeoman stock on his father's farm near Mantua in Cisalpine Gaul. Not until 49 B.C., when Vergil was twenty-one years old, was Roman citizenship extended to all of the freemen of this region. Throughout his life, Vergil's pride of citizenship was displayed through his exemplary life no less than through his writings. The poet Horace said of him, "earth bore no whiter soul."[2]

In the *Georgics*, the Italian Peninsula was for the first time presented as a living and organic whole, extending from the Gulf of Taranto to the Alps. Earlier agricultural writers saw chiefly the fields, orchards, and pastures. To Vergil the country was made up of mountains, valleys, and intervening slopes—all integrated but each responding in its individual way to the action of the wind, rain, and sun.

The productive lowland fields owed a double debt of gratitude to the mountains. The rivers rising there gave not only water for irrigating the fields, but also, in their downward course, picked up rich soil and fed it to the valleys. Below the wooded mountaintops, lay pastures for sheep and goats, and lower still, olive orchards and vineyards. Land too poor for crops could, with care, produce aromatic herbs and flowers that would attract bees. No land need be idle since each site had some specialty to produce.

The general crop regime described by Vergil resembled that of Cato. He recommended abundant dunging of the land, fallowing to restore worn-out soil and to permit the land to accumulate moisture, and plowing and cross-plowing to kill the weeds and to form a mulch that would reduce

[1] This article is one of a series on pioneer soil conservationists of the western Mediterranean world that was prepared by the author while a member of the staff of the U. S. Soil Conservation Service. For the titles of the articles already published, see *Agricultural History*, 18:35 (January 1944).—*Editor.*

[2] Quintus Horatius Flaccus, *Satirae*, 1:5:41–42.

evaporation during the summer. On several occasions farmers are warned never to plow the land when it is wet. To a greater extent than Cato, Vergil urged farmers to observe closely the natural vegetation and in planting crops to conform as closely as possible to whatever "Nature's power ordains for place and time."[3] Like ecologists of today, Vergil realized that natural vegetation was the best single index of environment, representing the interrelation of soil, climate, and slope.

On natural grasslands Vergil noted that the soil was dark, with a crumb-like structure "such as plows make by art."[4] For all grain crops this land was best. Next came virgin lands that never before had been plowed, although pines and ivy often proved a sign of cold soil little suited to crops. This advice of Vergil is in full accord with the tenets of modern soil scientists.

Vergil laid claim to no discoveries that advanced agriculture but rather assembled an anthology of the best current practices of his time. In the hundred and fifty years since Cato wrote, agriculture had progressed, and this progress can be noted in the *Georgics*. Earlier agricultural writers came from central or southern Italy. To their works Vergil added the experience of the north, where farm practices had been modified by contact with the Celts.

In *De agri cultura*, Cato implied but never specifically mentioned crop rotations. By Vergil's time a simple form of rotation had been accepted by farmers. This consisted of fallow, grain, and legume. It marked a definite advance in agriculture since it permitted cultivation two years out of every three, instead of alternate years only.

Alfalfa had also become a standard fodder crop throughout Italy. Apparently it was unknown to Cato, but Varro a century later mentioned it. According to Pliny,[5] it was introduced into Greece during the Median wars and from there was brought to Italy. Although the Romans did not recognize the scientific basis, they did realize that alfalfa would serve well in place of manure. By adding nitrogen to the soil, alfalfa replaced in part that which had been removed by erosion, leaching, or continuous crop production. A single sowing would last for ten or more years, and several cuttings could be secured annually. In addition the increased fodder production encouraged animal husbandry, and larger quantities of manure were made available for improving the soil of cropped fields.

The north of Italy, where Vergil spent his childhood, was particularly susceptible to erosion because of nearness to the Alps with their heavier rainfall and greater run-off. The winds from the mountains increased in velocity as they descended and created a serious problem of wind erosion also.

Vergil was one of the earliest Roman writers to mention the destruction caused by wind. He had seen—

> . . . a war of winds rush down and smite
> The full corn far and wide, and from the roots
> Uptearing, toss it high, as wintry storms
> Dark whirling, sweep up stubble and light straw.[6]

Such storms did most damage during the dry summer season, and in consequence Vergil doubted the value of plowing when the surface soil had been baked to a crust.

More than any other Roman writer, Vergil realized the destruction caused by floods and run-off following storms. Plowed soil, standing crops, and even flocks of sheep were carried away by water rushing down the slopes and flooding the fields. He described storms in which—

> Down crashes the whole sky, and floods of rain
> Drown the fair fields and all the oxen's toil.
> The trenches overflow, the channelled streams
> Swell with a roar . . . .[7]

To reduce the damage, Vergil recommended that in the lowlands the water be divided into many small channels and carried to the fields where it is needed to irrigate the crops. On the slopes the vines were planted in straight rows but arranged in such a way that the plants in any one row were opposite the unplanted spaces in the rows above and below. Each vine was planted in a hole or trench, and the soil about it was kept porous by frequent plowing and digging. In addition stones or shells were placed in the holes so that "trickling

[3] Publius Vergilius Maro, *Georgica*, 1:61, in *The Georgics and Eclogues of Virgil*, translated into English verse by Theodore Chickering Williams, with an introduction by George Herbert Palmer, 26 (Cambridge, Mass., and London, 1915).

[4] *Georgica*, 2:204, in *ibid.*, 54.

[5] Gaius Plinius Secundus, *Historia naturalis*, 18:43.

[6] *Georgica*, 1:318–321, in *The Georgics and Eclogues of Vergil*, 37.

[7] *Georgica*, 1:324–327, in *ibid.*, 37.

rain may through them glide." In this way the loose soil about each vine absorbed the run-off from the unplanted space above it, provided underground drainage, and so prevented the water from washing down the slope and carrying with it the soil from the vineyard. To protect the vines still further flat stones were pressed above the roots of newly planted vines as a "bulwark against beating showers." So arduous was the work in vineyards that Vergil admonished farmers to "admire wide-spreading acres; but let your own be few."[8]

Vergil's description of the plow implies another and important method of erosion control—contour plowing. The casual reference suggests that the hillside plow was familiar to farmers in northern Italy. His was the earliest known description of the plow:

> Then, while still growing in the woods, an elm is bent with great strength and subdued so as to form a plow-beam (*burim*) and is made to assume the shape of the curved plow. To this plow-beam a pole stretching out eight feet, two moldboards, and share-beam with two ridges are fitted at the base. A light linden is also felled in good time for a yoke, a tall beech is cut for a handle to guide from the rear, the car below; and all this wood is hung over the hearth and seasoned by the smoke.[9]

The plow described was a light plow with two moldboards that were used interchangeably, depending upon the lay of the land. If the plow were tilted to the left the moldboard turned the earth in that direction. By tilting it to the right the other moldboard was brought into use and the earth was turned in the opposite direction. This Vergilian plow is considered the original ancestor of all hillside plows, including the turn-wrest plow of Kent.[10] Vergil was also the first to mention wheeled plows. According to one authority, both the wheels and the double moldboards were of Celtic origin and were introduced into Italy by way of the Po Valley.[11]

By Vergil's time, however, the Celt was no longer a foreigner to Rome. All free Italians, regardless of their origin, were Roman citizens, and Vergil was both the first poet and the first agricultural writer of the Roman Empire. Although an intimate friend of Augustus Caesar, he was country-born and country-loving. He knew the problems and hardships of the farmers, but he also recognized theirs as the noblest and, fundamentally, the most patriotic of all professions. For the benefit of farmers, he assembled and presented the best information on agriculture that was available at his time. For six years, Vergil worked on the *Georgics*. When they were finished, farmers and city dwellers alike acclaimed their merit. Even today, agricultural writers still refer to the high standard set by "Vergilian agriculture."

[8] *Georgica*, 2:412–413, in *ibid.*, 62.

[9] *Georgica*, 1:169–175. For a literal translation, see J. B. Passmore, *The English Plough*, 67–68 (London, 1930).

[10] Passmore, *The English Plough*, 65–73.

[11] Louis Reynier, *De l'économie publique et rurale des Celtes, des Germains et des autres peuples du nord et du centre de l'Europe*, 331–332, 414 (Genève, Paris, 1818).

AN OLD QUESTIONNAIRE FOR MODERN USE

A Commentary on *Relaciones geográficas de Indias*

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Hidden away in old Spanish colonial records is much highly valuable geographical and agricultural information about Latin America awaiting "discovery" and utilization by modern scientists. Spain's rulers had learned much of the technique of conquest before the venturing of the conquistadors into the new American world. One of the most valuable results of that technique was the accumulation of records that embody data of permanent scientific interest.[1]

As early as September 5, 1493, Ferdinand and Isabella wrote to Columbus: "We ourselves . . . have seen something of the book you left us, and the more we see and speak of this, the better do we realize how great a thing has been this business of yours and that you have come to know more of it than anyone ever thought mortal man might know."[2] Their Catholic Majesties, however, requested more precise information than that contained in Columbus' book, now lost, and concluded with the slightly pessimistic prayer that God would be pleased to allow Columbus' future achievements to correspond to those of the past.

After the first voyage of Columbus, miscellaneous information about the New World began to accumulate from various sources. Letters described the marvels of the strange new lands; contracts of discoverers occasionally contained clauses making the writing of reports imperative; and regional governors demanded reports of subordinates.[3] The royal curiosity apparently did not crystallize immediately into a definite policy for the collection and formulation of reports from the Indies.[4] Possibly the sovereigns felt that it was too much to expect a discoverer to be a reporter as well.

From the heterogeneous accounts of discoverers, conquerors, and settlers, the geography of the New World began to take written form. The collection and classification of social and geographical data became a matter of economic, political, and religious significance for the solution of such practical problems as settlement of new lands, determination of boundaries, distribution of Indian population, and imposition of taxes. A definite policy of historical-geographical reports developed.

In 1569, a questionnaire of 37 sections was circulating in all the lands of the Indies. The *Ordenanzas reales del Consejo de Indias*, published in 1571, contained a recommendation for the formation of a descriptive book of all the provinces. It was to be based on reports sent from the New World and was to be written in Spain in accord with a set form called the *Título de las descripciones*. This form seems to have been lost, but there still exist various questionnaires which were drawn to take its place and to supply patterns for reports of information. One was of 200 sections, another of 135, and, in 1577, came the most popu-

[1] One of the most useful editions of such records is the excellent *Relaciones geográficas de Indias*, which, title notwithstanding, refers only to the lands under the old viceroyalty of Peru. Under the editorship of Marcos Jiménez de la Espada, its four volumes were printed in Madrid, 1881–1897. Hereafter this edition will be referred to as *Relaciones geográficas*. The work contains a valuable introductory account of the various series of reports known as the Relations; the available Relations about Peru; alphabetical lists of all other Relations with which the editor was acquainted, with notes on their location and on the sources of his information; and a general index of the geographical names in his four volumes.

[2] *Relaciones geográficas*, 1:xx.

[3] Diego Velázquez asked Cortés to look into the matter of "the secret of the said islands and lands and all the rest bordering on them," the manner and conversation of the people of each, as well as the flora, fauna, and minerals. He had heard that some of the people had large, broad ears and that others had faces like dogs. Cortés was to investigate and forward a report as soon as possible. *Relaciones geográficas*, 1:xxvii.

[4] Jiménez de la Espada noted an absence of any request for records in the years 1523 to 1528. From 1529 to 1573 a greater desire for information is indicated, but even then reports were not always demanded. *Relaciones geográficas*, 1:xxv–xxvi.

lar of all, that of 50. In the early seventeenth century, a 355-section form was adopted.

The questionnaire of 1577 was the one generally followed in the Relations of Peru. It began with a message from the King to his Governor in the New World.

> Since those of our Council of the Indies have divers times considered the order which could be given so that thereby might be had certain and particular relation and information of the things of the said Indies, in order to be better able to attend to their good government, know that it has seemed to be a very proper thing to order that there should be made a general description of the whole state of our said Indies, the islands and provinces of them, and that in the most precise and certain manner that may be possible; and, furthermore, in order that the said description may be more successfully made, it has seemed proper to command that the order be followed which is contained in the instructions made for that purpose, printed, and enclosed herewith. And because it is our will that the said description be made separately in each province, we command that as soon as you receive this our decree, you provide that a description be made of that city where you reside and of all the places within its extent and jurisdiction; and to each of the governors, corregidors, and *alcaldes mayores* of the district of that department you will send the number of copies of the said instructions which may seem necessary to you, for their distribution in the Spanish and Indian towns under your rule, sending order that what is commanded in the said instructions be done and executed with all speed. Having collected the Relations which will be made in each town, you will speedily send them, and those that you will have made, to our said Council of the Indies, so that there they may be seen, advising us if there be any missing, and why, that the proper measures may be taken. Done in Sant Lorenço el Real, this 25th of May of 1577. I, the King.[5]

Then followed directions for answering the questionnaire. The persons in charge of making the individual relation for each town were to answer the sections in the following order and form. On a separate page they were to put as a heading, the day, month, and year, and the names of the person or persons making the report and of the governor or person who had sent the instructions to them. After reading attentively each section, they were to write their replies, answering according to number, one after the other. If there was nothing to report on certain sections, they were to be omitted. The answers were to be brief and clear "in everything, affirming as certain whatever might be so and whatever was not certain, putting it down as doubtful."

The 50 sections of the questionnaire itself may be grouped in 9 divisions: Questions on the province as a whole (1–6); the Spanish towns (7–10); the Indian towns (11–15); the land in general again (16–33); religious organization (34–37); seacoast towns (38–47); abandoned Spanish towns (48); miscellaneous data (49); and the signatures of the authors (50).[6]

As a whole, while not too well organized, this questionnaire betrayed a desire for information about the general character of the land, its climate, vegetation, animals, and minerals. It also showed a curiosity in regard to the history of the Indian population and its mode of life.

A typical report, illustrative of the way the questionnaire really "worked," is that of the city and district of Sanct Joan de la Frontera de Guamanga, written in 1586.[7] The beginning stated that the King had requested a report from the Viceroy, who had forwarded the request to the alcaldes of the city. They, in turn, had ordered Pedro de Ribera, citizen and *regidor*, and Antonio de Chaves y Guevara, citizen, to do the work. Section by section, the gist of the questionnaire and this particular report follow.

1. The region's name and its origin. In the time of the Incas this province was called Vilcas Guaman. The authors gave an Indian etymology for the name, which the nineteenth-century editor of the Relations regarded as suspicious. The town was situated between Cuzco and Los Reyes (Lima) and in former times was a place where supplies were stored, notably for war.

2. Discovery and conquest. The answer tells who first founded the town, where it was first located, why the site was changed, how it got all the several parts of its name.

3. Climate. In the reply, the authors stated:

> This city has so moderate a temperature that it is neither cold nor hot; so pleasant is it that neither in summer nor in winter do the heat or cold cause affliction. In May and June it freezes moderately. Generally the rains are at their height in January and February; from then on they gradually diminish, and they are always moderate. The rivers rise until the month of March and then return to their normal state. The

[5] *Ibid.*, 1:cxiii.

[6] *Ibid.*, 1:cxv–cxix.

[7] *Ibid.*, 1:105–138.

soil is dry and on *tosca*. At nightfall and at dawn there is some dew .... Almost the entire year the sky is clear and serene, save only at that time when, as I have said, it rains. The most frequent wind is that from the south, and it is somewhat cold; it comes oftenest at the beginning of winter .... The north wind blows sometimes when it freezes, although not violently, and it cools the air somewhat. Almost this same temperature and state of the heavens are to be found within a two league radius of this city. Beyond that, toward the south and east and west, there are cold uplands which the Indians call *punas*. They are uninhabited and serve as grazing ground for the Indian livestock which requires such land; on it is no firewood except for some short ... straw on which the said livestock grazes. And before coming to this land there are hot valleys where there are streams of water and groves, and on the hills in the valleys another small grove which provides firewood. Eight leagues from this city and within sight of it, there is a snow-covered mountain ridge where snow falls all year; from it and from the cold mountain system there comes a slight wind. And it is to the east. This wind is somewhat harmful to those having catarrh and rheumatism, although not enough so to do much damage. And with the qualities mentioned, this place is considered as the best and of the most healthy climate of all the towns settled in this realm and even in a very great part of the world.

4. The character of the landscape. The authors noted that their province was rough mountain land, with few small plains and many deep ravines. There were no mountains, however, until one came to the Andes, 18 or 20 leagues to the east. Near the city flowed a small stream used for drinking water, and from it a canal was drawn to supply houses and gardens. As the stream was a little one, the town was somewhat lacking in water. The authors then discussed streams in the neighboring valleys, the things grown there, and the cattle. In an absent-minded moment they forgot their questionnaire and considered the condors and the harm they did to livestock, the need for Indian guards for cattle, and the desirability of requiring the Indians to pay one condor a year tribute so that there would be fewer.

5. Pertinent information about the Indian inhabitants, such as their numbers, whether or not they were increasing, the state of their understanding and inclinations, their manner of living, and their languages. The report states that there were 35,000 or 36,000 Indians in the province, according to the census ordered by Viceroy Francisco de Toledo. In the time of the Incas there had been twice as many, but the wars had cut down their numbers. When the city was founded, there were some 50,000 Indians, but in the wars mentioned many died. At the time of the report, their number was diminishing because they were going far away to the quicksilver mines of Huancavelica, where harm befell them. Such Indians as remained were settled in reductions, which were moved from place to place to counteract the disadvantages of climatic changes and unhealthy or inconvenient sites. The governors and corregidors who had given their permission for such changes were to be consulted for any further information desired.

The Indians were described as medium in stature, good in appearance, and somewhat dark. Their understanding was of low degree, and they were inclined to depravity. They were so phlegmatic and lazy that they would not even grow their own food unless driven by the caciques in command.

Everything they do is slowly done and by compulsion. They are malicious, lying, thievish; only for malice have they any sharpness of wit. They are dissemblers, and they are revengeful—not getting their revenge like honorable people, but cautiously and on the sly. They lack charity. By condition they are cowardly, and for that reason they are all the more cruel when they may safely be so. They are very ungrateful. They have the appearance of Christians, but while they easily receive baptism, with difficulty do they keep to the things they promise in it. They are capital enemies of the Spaniards. All farm, although by force, and they are content with very little; they do not store up things for their children. Their wives make their clothes and drinks and do part of the sowing of their crops. In order that they may take their ease and drink, of which they are so fond that they consider it an honor to be generally drunk, the Indians make their wives work excessively and treat them like slaves. There has been no remedy found for this. There are sorcerers among them, and out of interest they pretend to be doctors. They are very fond of foretelling the future. Their clothes are made from the wool of the native livestock, and they have the custom of raising some of these animals to serve as food or as beasts of burden. They have different languages, because each group speaks its own, but all speak the general language of Cuzco which the Incas ordered them to speak, and they have continued in this very necessary custom, though using their own language among themselves.[9]

[9] A paraphrase of the original Spanish text.

6. The height or elevation of the pole or the days of the year when the sun casts no shadow at noon. The reply reads:

> Cosmographers who have examined the elevation of the pole and the distance from the equator have been heard to say that this town is 13 degrees toward the south, and it has been noted that from the 15th to the end of October is the time in this city when the sun passes through the middle of the heavens without making any shadow at noonday. From then on, it goes down toward the south; it has not been observed on the return when it comes back to the north, because of the cloudy weather at that time.[9]

7–10. The sections on Spanish towns were to include their location with respect to the administrative center of the region (7) and with respect to the neighboring Spanish settlements (8); their names and those of the founders, with population figures for the dates of the settlement and the questionnaire (9); and their lands (10). In this last connection the Crown wished to know whether the town was located on high, low, or flat land; a sketch would be appreciated.

The writers estimated that their city was 79 leagues from Los Reyes (Lima). After giving the extent of the town's lands and location with respect to neighboring towns, they described the roads between them.

> ... if one wishes to go from Cuzco to Lima or from Lima to Cuzco [*sic*] or from the city of Guánuco, which is 80 leagues from here over the sierra towards the Andes, one is forced to go through this town or else go to Lima via Los Llanos or by very dangerous and winding roads. The leagues of course are big ones, longer than the average, as has been seen in some places where they have been measured. They are over rough country of very few level places, and hence along winding roads which twist to avoid ravines and rivers and precipices; and the roads are the kind covered on horseback save in some bad spots, where because of the danger, some people dismount.

When the authors reached section 9, they ventured some subtle, or perhaps unconscious, criticism of the questionnaire. They said that under sections 2 and 3 they had already answered sections 9, 10, 16, 17, 18, and 19 and that they were passing over the ones not under their charge.

11–15. The sections on Indian towns were to state their location with respect to Spanish administrative and ecclesiastical centers (11) and to other Spanish and Indian towns of the region (12). They were to give the names of the towns and state the specific Indian languages spoken (13). The pre-Spanish history was to tell whom the Indians served before the coming of the Spaniards and the amount of taxes paid and include a discussion of Indian customs and religion (14) and of Indian government, clothing, food, and health (15). The authors of the report under consideration blithely omitted the sections on Indian towns entirely and turned to the consideration of the land in general.

16–33. These sections were concerned again with the region in general. They called for the location of all towns (16); the healthiness of their sites, *i.e.*, mountain, valley, or plain (17); and the distance of the region from a mountain range (18). Rivers, lakes, lagoons, springs, and irrigation in general were asked for in sections 19 and 20. In section 21 the scribe was to note volcanoes, caves, and "other admirable and noteworthy things." The next 5 sections on vegetation were to include native trees and those brought from Spain or elsewhere, native and Spanish food crops, and poisonous or medicinal plants. Section 27 requested information on wild and domestic animals and birds; sections 28 and 29, on minerals; section 30, on the salt beds of the region and where the settlers got all the other things they needed for food and clothing.

In the report on Sanct Joan de la Frontera de Guamanga, three hot springs were noted. One had been made into a bath, and the water was good for rheumatism, phlegms, and the itch. It was supposed to induce pregnancy in women and to give a pleasant taste to fruit when used for irrigation of a certain vineyard. The second spring was considered good for tumors because it induced perspiration; however, it was reported, quite inconsistently, to be even more potent in June and July when it froze. The third spring was also good for tumors, the itch, and old wounds. Thus the authors slyly combined section 21 with 20.

The sections on vegetation (22–25) in the report were sensibly combined and, disregarding the specifications, were numbered 21. This section begins with a statement that trees have already been covered, save for the coca tree, which is discussed even though not in the region. Mention of the coca tree reminded the writers of other native fruits indigenous to the coca valleys, and they digressed farther by discussing honeybees,

[9] *Ibid.*

animals and insects, fish and crabs of the rivers of the Andes, the wet climate there, and birds—things admittedly not of their district but of the land where the coca grew. Section 26 rightly treats of the poisonous grass *miu* and of the cochineal.

The reply on section 27 tells of the native and Spanish animals and makes a noteworthy attempt at some classification; and 28 lists and locates mines and pleads for a larger supply of cheap Indian labor. Section 29 tells of alabaster quarries, unused because of the bad roads and their distance from the city; 30 is about salt deposits; while 31 tells how houses were built, describes the town, and gives its Spanish population. Listing 32 and 33 together, the authors really omitted 32. In answer to 33, they told how the Spaniards and Indians made their living in this little town and in what goods the Indians paid their tribute. The geographical part of this report ends here.

34–37. The sections on the religious organization of the communities asked for the location of the towns with respect to the religious center and for histories of the churches, monasteries, and convents, and hospitals and other charitable organizations.

38–47. In describing seacoast regions, scribes were to note whether or not the sea was stormy and when the storms usually came (38); details about the coast, such as its beaches, rocks, reefs, or other dangers for navigation (39); the daily and seasonal variations in the tides (40); and capes and bays of the coast line (41). Specific details were requested about ports—drawings (42), size and capacity (43), depth of water and indication of any obstructions (44), and location of channels and indication of winds needed for exit and entrance (45). Section 46 covered the supplies available in the region—wood, water, and food; and section 47, nearby islands—size, pasturage, trees, birds and animals, and rivers and springs. It was also stated that maps of the islands would be appreciated. These sections were omitted in the report here examined as the town was not on the sea.

48. If there were any abandoned Spanish towns in the district the report was to state when they had been settled, when they had been deserted, and why.

49. This final question asked for "all other notable things in nature, anywhere, including earth, air, the heaven, or anywhere at all." Both sections 48 and 49 were omitted by the writers on Sanct Joan de la Frontera de Guamanga, presumably because they had nothing to report.

50. The concluding section called for the signature and the transmittal of the report to the official who had sent the questionnaire.

The geographical information in these individual Relations is frequently and expectedly deficient. Whether local officials conscientiously wrote their best or had their subordinates do the work, generally speaking, the majority of the accounts were not written by trained observers. The reports were usually limited to a relatively small area, so that such details as the general slope of the land, its exact location and boundaries, the type of soil, its altitude, etc. are lacking. The authors often manifested shrewdness and common sense, but they were frequently careless in following directions, and their minds tended to focus on details. Birds, insects, plants, minerals, and Indians appeared in happy confusion. On the other hand, the organization of the questionnaire itself was poor for some topics were duplicated.

The very number of accounts, however, compensates for the many weaknesses of the individual Relations. It would be interesting to see how complete a picture a trained geographer could compose from the pieces of the jig-saw puzzle of the Peru of the Relations. Many pieces are there, but, even when using several accounts as the basis for a study of a particular region, some bits of vital information may quite possibly be missing; on the other hand, such accounts may well furnish still "undiscovered" data of definite modern utility.

If geography is to include not only a statement of the physical facts of a region but a consideration of its human society as well, these accounts with their naïve and picturesque revelations may well furnish a basis for a sympathetic insight into life in Peru at the end of the sixteenth century. Spain's hard-writing officials deserve gratitude for the surprising wealth of information they have supplied, rather than condemnation for their indiscretions of omission.

THE COLLECTION OF AGRICULTURAL STATISTICS IN GREAT BRITAIN ITS ORIGIN AND EVOLUTION

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The demand for accurate arithmetical information about farming and its net output is of long standing, and the details necessary for administrative purposes were envisaged nearly three hundred years ago. In 1676, Captain John Graunt, in his "Observations upon the Bills of Mortality," stated the necessity for learning such relevant details of the country's economy as the output per acre of corn and hay and the number of animals fed on the land, so that measures might be taken to supply any want that might occur if the crop failed.[1] He was far in advance of his day if only because the contemporary decentralized system of government would have effectually prevented the collection of the information, there being, for practical purposes, no central department which could have been made responsible. This fundamental obstacle was not surmounted until the end of the eighteenth century when Sir John Sinclair's Board of Agriculture was appointed with Arthur Young as its secretary.

The administrative difficulty obviously could not prevent the subject being discussed, and one or two pamphleteers either thought it would not be impossible to collect the information or wondered why the Government did not do it.[2] W. Pennington suggested a method and boldly said:

> Would not the application of a few pensions . . . be better directed to maintain a proper number of inspectors in each county, men of judgment and reputed integrity; who might every summer receive an account from the constables, delivered upon oath and attested, what number of acres is grown, and with what kind of corn, in their respective parishes. A few experiments would enable them to judge how it yielded in general; and by comparing the produce of different years, it would be easy to discover whether there was sufficient for home consumption.[3]

This is a singularly modern conception, dictated by the fluctuating nature of the inport and export of cereals at that date, the balance being just about to settle in favor of imports within a very few years.

Only half a dozen years later, William Donaldson went even further in his demands.[4] He asked for a central board of agriculture (not appointed till 1793) and proposed a statistical inquiry into the state of agriculture. He desired the information collected to include, amongst other details, the area under pasture and tillage, beasts kept, corn sown, and quantity reaped.

Between the dates of Pennington's and Donaldson's pamphlets, Arthur Young had completed his three major farming tours and made an attempt at what is perhaps the first farm management survey on record.[5] In the course of his tours, he collected a vast deal of arithmetical information about the places he passed through, including such details as size of farms, course of cropping, rates of seeding and yields, systems of manuring, methods of animal husbandry, wages, costs of commodities, and so on. His appreciation of statistical methods was, of course, limited by his place in time, and his treatment of his material is not all that might be wished, but a picture of farming in all its variations over a very wide area of the country can be drawn from his figures coupled with his fine descriptive writing, but no one man, however widely travelled, can hope fully to achieve such an object.

Long before Young, Gregory King had made

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[1] John Graunt, "Natural Political Observations Mentioned in a Following Index, and Made upon the Bills of Mortality (ed. 5, London, 1676)," in Charles Henry Hull, ed., *The Economic Writings of Sir William Petty*, 2:396 (Cambridge, Eng., 1899). Edition 1 appeared in 1662.

[2] Anonymous, *A Compendium on the Corn Trade*, 25 (1757); and *Sentiments of a Corn Factor on the Present Situation of the Corn Trade*, 22 (1758).

[3] W. Pennington, *Reflections on the Various Advantages Resulting from the Draining, Inclosing, and Allotting of Large Commons and Common Fields*, 47 (London, 1769).

[4] William Donaldson, *Agriculture Considered as a Moral and Political Duty*, 172 (London, 1775).

[5] G. E. Fussell, "A Youngs erste 'Farmbetriebs'-Aufnahme," Germany Reichsministerium für Ernährung und Landwirtschaft, *Berichte über Landwirtschaft*, 29:117–123 (Berlin, 1934), and "My Impressions of Arthur Young," *Agricultural History*, 17:135–144 (July 1943).

some estimates of agricultural production, etc., but, astonishingly accurate as his guesses seem to be, they were not based on a collection of returns made by or with the help of the farmers themselves. Other *ad hoc* and partial guesses by individuals and inquiries under Parliamentary authority had also been made in the eighteenth century into such debatable and debated questions as the area of waste land available for cultivation, but nothing of a really general and complete nature had been attempted.[6]

A golden opportunity was missed when the reporters who were appointed by Sir John Sinclair's Board of Agriculture were given their instructions, and this is the more surprising as Sinclair had already begun the publication of his *Statistical Account of Scotland* when the Board was formed. Sinclair's *Account* was not statistical in the narrow modern sense of the word, being largely a descriptive account of the individual parishes by the local ministers, and it took seven years, 1791–98, to complete the publication. The scheme was not a bad one. It was supported by the General Assembly of the Church in Scotland and by many of Sir John's influential friends, but it was only by "endless pertinacity" that he succeeded in completing it.[7] Even so, the arithmetical material provided by the parish ministers was not of a character to lend itself to tabulation in such a way as to provide what would today be regarded as the agricultural statistics of Scotland. This was partly, of course, because everyone of the ministers did not supply all the answers to the 160 questions asked in the schedule of inquiry sent to him, and partly because Sinclair himself did not, apparently, fully realize the necessities of the case.[8]

Even Young did not, in spite of the efforts to collect arithmetical information he had himself made when, on his "tours," because the instructions issued when the English Board of Agriculture planned its series of County Reports did not ask for detailed statistical information. It is true that there may have been a good reason for this. The reports were to be mainly concerned with methods of cultivation, crops, and stock, so that an encyclopedia of actual practice would be available, and local practices of one part of the country could be adopted in others if thought likely to succeed. The reporters produced descriptive accounts of each county accordingly. They were supposed to be on a uniform plan and are, in fact, fairly uniform, but they did not provide statistical information and it was still possible in 1808 for "An Old Tillage Farmer" to suggest that this very necessary information could be collected by the parish priests,[9] although it is to be feared that this would not have been practicable in England, particularly as Sinclair had no similar connection with the Church as in Scotland. This opinion is confirmed by the experience of the Board of Trade when, probably in the 1840s, an attempt was made "to obtain experimentally a set of agricultural statistics for the single county of Bedford, through the instrumentality of the clergy." It failed, only 27 out of 126 parishes being accounted for. However, the returns which did come in show that the information asked for was exhaustive, including "acreage, the gross produce and yield per acre of every crop, and the relative size of the farms, the class of soil, and even the prevailing mode of tenure."[10]

The old Board of Agriculture was dissolved in 1821 as an economy measure in a post-war depression, and the Royal Agricultural Society of England, a private body, which hoped to perform at least some part of its functions, especially the propaganda intended in the new slogan "Practice with Science," was not established till 1839.[11] It is surprising that no discussion of the need for collecting statistics of agricultural production should have appeared in the Royal Agricultural Society's *Journal* till 1856, but this is probably because the society was concerned primarily with questions of farming technique just as the reports of the old Board of Agriculture were.

The subject, however, continued to be ventilated in other quarters, and, before the abortive attempts of the Board of Trade to secure figures for Bedford, the magistrates of Norfolk tried in 1831 to collect statistics for their own county. They applied to some 680 persons and received 429 replies, a tribute

[6] "Early Estimates of Grain Growing in Great Britain," Ministry of Agriculture, *Journal*, 30:1012–1016 (1924).

[7] John M. Ramsay, "The Development of Agricultural Statistics," Agricultural Economics Society, *Journal of Proceedings*, 6:120 (1940).

[8] Alex M'Callum, "Sir John Sinclair," *Scottish Journal of Agriculture*, 19:215–255 (1936).

[9] An Old Tillage Farmer, *Thoughts on Tillage and the Corn Laws*, 68 (Exeter, 1808).

[10] P. G. Craigie, "Statistics of Agricultural Production," Royal Statistical Society, *Journal*, 46:7 (1883).

[11] Paolo E. Coletta, "Philip Pusey, English Country Squire," *Agricultural History*, 18:83–91 (1944).

to the wide outlook of the farmers of a county for many years then in the forefront of English farming practice. This attempt is mentioned by several writers on the subject, but they give no details of the information requested.[12]

The founding of the Royal Statistical Society in 1834 testified to the growing demand for precise knowledge instead of groundless estimates, and in the very first volume of the society's *Proceedings* William Jacob, a corn factor with a very large business both in England and as an importer who possessed his own organization for forecasting the annual wheat harvest, lamented that neither the quantity of cereals grown nor the amount of other agricultural products such as meat, tallow, butter, cheese, hemp, flax, etc., was known accurately.[13]

Other members of the society interested themselves and collected statistics of the localities where they lived. One of them, Henry Tremenheere, covered five parishes in Middlesex which have since been absorbed in London.[14] He presented a formidable volume of information in his paper about these parishes. It included acreage and rentals, number of livestock, acreage under crops, gross produce, and produce per acre of wheat, barley, oats, rye, beans, peas, hay, tares, turnips, mangel, potatoes, and clover. In a separate table the number of inhabited houses, families employed in agriculture, number of laborers employed in agriculture, and the total population of each parish were supplied, and the accompanying paper contained details of agricultural wages, some particulars of the state of cultivation, the use of improved farm machinery, and so on.

In the same vloume, Joseph Fletcher dealt with Norfolk in "Contributions to the Agricultural Statistics of the Eastern Counties,"[15] but it is not clear how the figures were derived. They purport to give the extent sown and estimated produce per acre of wheat and barley in Norfolk in 1838 as compared with 1836–37.

All this activity attracted some degree of Government attention, and in 1845 an attempt was made to collect agricultural statistics in a limited area of each of the three countries, England, Scotland, and Ireland, i.e. North Hampshire, Midlothian, and the Bailieborough Union. "The last, conducted by private agency, was entirely successful. The second was equally satisfactory, the agency of the parochial schoolmasters being employed. The English effort, by means of the boards of guardians, failed."[16]

Despite the failure of this attempt in England, Milner Gibson, then vice president of the Board of Trade, introduced a bill in 1847 to the House of Commons entitled "A Bill to make provision for the collection of Agricultural Statistics in England and Wales," but it did not pass beyond a first reading. A short epitome of his bill was given in evidence to a Select Committee of the House of Lords on Agricultural Statistics in 1854. It runs:

> The duty of obtaining the information specified in the Schedule attached to the Bill was entrusted to the Registrar-general of Births, Deaths and Marriages, the Superintendent Registrars throughout the country being charged with the appointment of "agricultural enumerators" in their respective districts. Those enumerators were to make lists of all the occupiers of land exceeding three acres, and to send the specified blank forms to them, which were to be filled up and returned to the enumerators within 14 days. The latter were to classify them, and make general tables from them, which were to be returned through the Superintendent Registrars to the Registrar-general by the 10th of July in each year for the use of the Board of Trade, who were to have power to alter the forms of the returns given in the Schedules as experience might show to be advisable.[17]

The machinery proposed is somewhat elaborate but not more so than that successfully and economically adopted by the East of Berwickshire Farmers' Club when it made an agricultural census of that county in 1849, an undertaking said to have cost no more than a five-pound note.[18]

The appointment of the Select Committee of the

[12] Craigie, "Statistics of Agricultural Production," 6–7.

[13] William Jacob, "Observations and Suggestions respecting the Collection, Concentration, and Diffusion of Statistical Knowledge regarding the State of Nation (abstract)," Royal Statistical Society, *Proceedings*, 1834–35, 1(2):9–11.

[14] Henry Tremenheere, "Agricultural and Educational Statistics of Several Parishes in the County of Middlesex," Royal Statistical Society, *Journal*, 6:120–130 (1843).

[15] Joseph Fletcher, "Contributions to the Agricultural Statistics of the Eastern Counties," *ibid.*, 130–133.

[16] Craigie, "Statistics of Agricultural Production," 7.

[17] House of Commons, "Report from the Select Committee of the House of Lords, Appointed to Inquire into the Best Mode of Obtaining Accurate Agricultural Statistics from all Parts of the United Kingdom; and to Report thereon to the House; together with the Minutes of Evidence, Appendix and Index," *Sessional Papers*, 1854–55, 8(501):142.

[18] Craigie, "Statistics of Agricultural Production," 7.

House of Lords on Agricultural Statistics in 1854 demonstrates the growing interest of the Government in the subject during the fifties, and this interest found expression in experimental work in both England and Scotland in 1853. By this time, Irish agricultural statistics were already regularly collected. So far as Great Britain is concerned the work was entrusted to a private body in Scotland, the well-established Highland and Agricultural Society, but in England it was again attempted through the medium of the Poor Law Inspectors.

For 1853, only three counties in Scotland were dealt with, Roxburgh, Haddington, and Sutherland. The tables submitted to the Board of Trade state the total acreage of the districts into which each county was divided; the arable acreages; the number of acres under different kinds of crops, i.e., wheat, barley, oats, rye, beans and peas, vetches, turnips, potatoes, mangolds, carrots, cabbage, flax, turnip seed, alternate grasses, improved permanent grass inclosures, and irrigated meadows; the number of acres not in crops, i.e., bare fallows, sheep walks, "houses, gardens, roads, fences, etc.," woods, and waste; and the amount of stock, i.e., horses, milk cows, other cattle, ewes, tups and wethers, and swine. The work was done by district enumerators who were selected by the secretary of the society and assisted by committees of local farmers. These returns were supplemented later by a further return showing the total produce of each crop in each district of each of the three counties. In 1854, the whole of Scotland was covered by this means, and the final tables were slightly amended, bare fallow being included in the tillage area and grasslands being divided into rotation grass, permanent pasture, irrigated meadows, and sheep walks. Calves were set out separately amongst the livestock and sheep divided under male and female heads. Tables showing the average yield per acre were also provided. This work was continued under the aegis of the society and with the benediction of the Board of Trade until 1857 when the criticism of the expenditure of the annual grant of some £6,000 made to the society by the Government departments proved so onerous that the work was discontinued.[19]

In England the 1853 experiment was confined to Norfolk and North Hampshire, and, although the opposition of the farmers to the proceedings appears to have been weaker than formerly, the experiment was not completely successful, gaps sufficiently large to prejudice the accuracy of the returns being unfilled. This work was done by the Poor Law Inspectors, Sir John Walsham and William Henry Toovey Hawley, through the agency of their clerks, relieving officers, and so on.[20] The same information as that secured in Scotland was asked for, and the experiment was extended to a few other counties in the following year with similar results,[21] so that this method of collection failed to commend itself to witnesses before the House of Lords Committee in 1854.[22]

Probably similar objection would have been taken to a suggestion put forward by Samuel Paull in that year. It was for nothing less than an annual land utilization survey, which is another confirmation of Solomon's well-known wisecrack of the antiquity of things.[23] Paull advised the appointment of a popular and respected individual in each parish who would mark on a parish field map at a given date each year its visible crop. The village schoolmaster or some equally competent person should make or be given a terrier of the fields in the parish and should add to this terrier columns for every sort of grain and vegetable crop, then in a proper column add the area of each field thus getting acreage and produce for each parish, the results to be collected and tabulated by the Board of Trade.[24] This would, if continued for a series

[19] See the reports of the Highland and Agricultural Society of Scotland to the Board of Trade on the agricultural statistics of Scotland for 1854–57, inclusive, in the House of Commons, *Sessional Papers*, 1854–55, 47(1876):1–19, (343):1–4; 1856, 59(2):1–25; 1857 (sess. 1), 15(2154):1–32; 1857–58, 56 (2307):1–25. For the correspondence relating to the discontinuance, see House of Commons, *Sessional Papers*, 1857–58, 56(34[2329]):1–52. The same data are given in the Society's *Transactions* (ser. 3), 6:6, 205–216, 392–399, 483–512 (1853–1855), 7:3–4, 66–68, 201–230, 457–492(1855–1857), 8:7–8, 201–224 (1857–1859); and the *Journal of Agriculture* (n.s.), 7:249–266, 597–598, 603–612 (1855–1857), 8:273–282 (1857–1859).

[20] House of Commons, "Reports of Sir John Walsham and Mr. [William Henry Toovey] Hawley on the Agricultural Statistics of Norfolk and Hampshire," *Sessional Papers*, 1854, 65(1761):1–23.

[21] House of Commons, "Reports of Poor Law Inspectors on Agricultural Statistics (England), 1854," *Sessional Papers*, 1854–55, 53(1928):1–96.

[22] For the testimony, see House of Commons, "Report from the Select Committee. . . ."

[23] See G. E. Fussell and M. Compton, "Surveys and Surveyors: Modern Land Utilization Surveys in England and Wales," Land Agents' Society, *Journal*, 37:476–482 (1938).

[24] Samuel Paull, "On Agricultural Statistics," Royal Statistical Society, *Journal*, 17:160 (1854).

of years, certainly have been very useful and the annual series of local maps would have provided a sound basis for administrative purposes such as have since proved necessary in war, but it was too elaborate for his day, and indeed the modern Land Utilisation Survey of the country conducted through other agencies has been in progress for some years and is still not yet complete.[25]

By this time, the subject had, owing to the Government's experiments and the various suggestions thrown out by individuals, become one of public controversy in both the agricultural press and in such national newspapers as the *Times*; but there was still a wide divergence of opinion on the value of agricultural statistics. For instance, John C. Morton who published his well-known *Cyclopaedia of Agriculture* in 1855, found that pressure on space was so heavy that something had to go and omitted his promised articles on "Agricultural Statistics" and "Agricultural Societies," presumably because these subjects were of minor interest to the practicing farmer. On the other hand, Robert Kemp Philp, who attempted an estimate of the annual value of the agricultural output in 1859, considered it unfortunate that there were no reliable statistics "upon which to ground a calculation."[26] The difficulties experienced in the early experimental collection of farm statistics made no impression on so experienced a farmer as C. Wren Hoskyns, for to him the essential necessity of possessing the information was self evident.

Hoskyns pointed out that recourse to enclosure and cultivation of waste land was, for practical purposes, no longer available in 1855. All that could be done to increase food production was to increase the yield per acre, and there were no more definite means of judging whether that yield was increasing or not than the opinion of single persons. The nation was in the position of a vessel on a twelve-month voyage without the possibility of calling at a port during that time, and the commander of such a vessel who did not know what provisions he had in the hold nor the rate at which they would be consumed would be little better than a fool. This was nevertheless the national situation, and one result was the tremendous price fluctuation at different times of the year for corn of the same harvest, a bad thing for both producer and consumer.

[25] For the objectives and methods, see L. Dudley Stamp, "Land Utilization Survey of Britain," *Geographical Review*, 24:646–650 (1934).

[26] Robert Kemp Philp, *The History of Progress in Great Britain*, 136 (London, 1859).

Again the facts were apparent to the eye and easily got together. "The simplicity of the measurement of land," he said, "the permanence of the task once accomplished, the patent and unconcealable evidence of its crops, lying for weeks and months before the eye, together with the constant habit in the mind of every farmer of calculating the amount per acre of the growing crop, seem to suggest the question whether physical difficulty can properly be said to have ever really entered into the question."[27] The failure of the experimental work done through the Poor Law Inspectors was largely due to an unhappy choice of agent and not to the intrinsic difficulty of the job, an opinion shared by a number of witnesses examined by the House of Lords Committee in the previous year. In spite of this the Select Committee reported in favor of the compulsory collection of agricultural statistics, proposing, as a penalty for failure to cooperate, the cost of collecting the figures. The work was to be done by the Highland Society in Scotland and the Poor Law Inspectors in England,[28] but these agencies proved abortive for the reasons given above.

The question continued to agitate the Government. Before leaving the Board of Trade, Gladstone had pledged Parliament to make an effort to collect agricultural statistics, and James Caird, an enthusiast for the work, continued to seek action. The Chairmen of Quarter Sessions in England and Wales were circularized by the Secretary of State in 1862, asking for the opinion of the county magistrates as to the possibility of gathering the information through the county constabulary, as had been done in Ireland for many years. The schedule enclosed with the circular only specified the acreage under crops, but the magistrates were asked their views regarding "the extent of the information to be collected." The replies were very varied but on the whole were not in favor of this proposal, and again the matter was left in abeyance.[29]

Caird was not deterred and at length in 1864

[27] C. Wren Hoskyns, "On Agricultural Statistics," Royal Agricultural Society of England, *Journal*, 16:568 (1856).

[28] Ramsay, "The Development of Agricultural Statistics," 122.

[29] House of Commons, "Copy of a Circular sent to the Chairman of Quarter Sessions in England and Wales, with Reference to the Collection of Agricultural Statistics, with the Resolutions come to thereon; together with Copies of any Correspondence on the Subject," *Sessional Papers*, 1862, 60(205):1–31.

carried a motion in the House of Commons against the Government. The collection of national agricultural statistics began in 1866. The Board of Trade was the responsible department and the work of collection was done by the Inland Revenue authorities. The first volume, containing details for 1866 and 1867, was published in the latter year,[30] but the method of collection was more particularly described in the preface to the second volume covering 1868. The figures were "collected, as in the previous year, from all Occupiers of Land and Owners of Live Stock. The duty of distributing and collecting Forms for obtaining the requisite information, and of tabulating the same for Counties, was again entrusted to officers of the Inland Revenue Department."[31] It appears that the forms were distributed and collected very largely by free post.

Some apparently irrelevant information was included in the final tables, such as the number of persons from whom returns were obtained, but substantially the basis of agricultural statistics was finally established. The total acreage in each county under crops, bare fallow, and grass was ascertained, as well as the area under "Corn crops," "Green crops," "Clover and Artificial and other Grasses under Rotation," and "Permanent Pasture, or Grass, not broken up in Rotation (exclusive of Heath or Mountain Land)." Only three headings were provided for farm animals—cattle, sheep, and pigs. By 1869, the corn crops had been classified as had the green crops, and the number of agricultural horses was included. These details are still, with the modifications that experience has shown to be necessary, the backbone of agricultural statistics. A table showing the acreage under orchards, market gardens, nursery grounds, and woods in each county in England, Wales, and Scotland first appeared in 1872. The simple heads, cattle, sheep, and pigs, were later split up into the different classes of animals in the three categories.

Although the early volumes contained estimated yields of the principal corn crops and of potatoes in British possessions and foreign countries, no attempt was made to secure either gross produce or acreable yields for the home countries, and Craigie made his admirable paper a plea for the addition of this information.[32] By way of showing what could be done, he appended tables, compiled with some labor from the isolated references to yield in Arthur Young's works and other publications of different dates between 1770 and his own day, showing the yield of wheat, barley, and oats in each county and giving a picture of the improvement in yields that had taken place in about a century.

Either as a result of Craigie's essay or the transfer of the responsibility to the new agricultural department of the Privy Council in 1883, yield returns were promised at the end of the preface to the report for that year as soon as the necessary arrangements could be made to secure them. In 1884, divisional and county yields for England, Wales, and Scotland, together with a combined yield for Great Britain were published, and in 1885 these figures were amplified by the addition of estimates for Ireland and the United Kingdom, while county yields for England, Wales, and Scotland were also introduced. The necessary local information was collected by a large number of crop reporters who were appointed on a part time basis. Their number was added to in later years. This method of collecting the information is still current although it has been subjected to some criticism.[33]

The crop estimators had been appointed by the local officers of the Inland Revenue (Customs and Excise), and, although the Board of Agriculture was set up in 1889 and took over the responsibility of publication of the annual statistics, the work of collection and tabulation continued to be done by the Inland Revenue people and their nominees until 1912. The pressure of other business then made it necessary for that department to slough off this work, and the schedules were forwarded direct to the Board of Agriculture and those relating to Scotland to the newly formed Board of Agriculture for Scotland. In 1919, the crop reporters with a strengthened personnel and increased pay became directly responsible for the work of distribution and collection of the individual returns to the Ministry of Agriculture thus finally relieving the local officers of the Inland Revenue of all participation in the work.[34]

[30] Board of Trade, Statistical Department, *Agricultural Returns for Great Britain, with Abstract Returns for the United Kingdom, 1867.*

[31] Board of Trade, Statistical Department, *Agricultural Returns of Great Britain, with Abstract Returns for the United Kingdom, British Possessions, and Foreign Countries, 1868*, p. 3.

[32] Craigie, "Statistics of Agricultural Production," 40–42.

[33] See J. A. Venn, "An Inquiry into British Methods of Crop Estimating," *Economic Journal*, 36: 394–416 (1926); and H. D. Vigor, "Crop Estimates in England," Royal Statistical Society, *Journal*, 91:1–33 (1928), and "Discussion on Mr. Vigor's Paper," *ibid.*, 34–38.

[34] Ramsay, "The Development of Agricultural Statistics," 123.

The tables giving acreage under crops with numbers of livestock combined with the acreable production of crops went a long way towards supplying a sketch of the national output of agricultural produce, but it was by no means a complete picture. An attempt to make a complete census of agricultural output was first made in 1908. Obviously special inquiries had to be made to obtain data to fill up the gaps in the annual statistics which did not include the production of meat, milk, wool, poultry, eggs, fruit, vegetables, etc. Labor and machinery employed on the farms was included in these inquiries and the results were published in 1912.[35] A second similar census was begun in 1913 but was abandoned owing to the outbreak of war. It was not till 1925 that another was made and for that year separate reports on England and Wales, and on Scotland were issued.[36]

Besides the general information mentioned, some other details were gathered from the early days amongst which was the number of occupying owners and tenant farmers who filled up returns and gave indications of the size of their holdings, the latter becoming more precise as time went on. Details of the ownership of land and the size and situation of landed estates are, however, missing.

Further, the early volumes contain a great deal of information collected from other publications as to the price of cereals, wheat, barley, and oats, and the import and export of farm produce as well as data relating to British possessions and foreign countries. It was not until 1904 that the Board appointed its own market reporters and published additional price returns secured directly from these officers covering livestock, dead meat, dairy produce, potatoes, vegetables, fruit, hay, and straw.[37]

Substantial and varied as the Agricultural Statistics are, they do not provide all the desiderata considered necessary by those who agitated for their collection, and they have been considered lamentably deficient by some critics who have assayed the material from the point of view of its administrative use. Sir Henry Rew was one of these, and he based his criticism on the belief that no problem connected with the production and consumption of an agricultural product could "be satisfactorily solved unless data are independently collected both of production and consumption."[38]

Moreover, the data relating to land use are so carefully generalized that no actual idea of the farming of a particular area smaller than an administrative county can be gleaned from the published figures, but the data are collected on a parish basis and the local figures are available for reference. Even the incomplete Land Utilisation Survey will, by virtue of the length of time it is occupying, be of less service in this direction than it might if it had been completed in one year. Had Samuel Paull's ideas regarding the collection of the necessary data been carried out, a large body of information regarding each field in every parish would now have been available, and consequently the possibilities of production at least could have been completely envisaged. The method would doubtless have been expensive and perhaps too cumbersome to have been easily administered, so it was not adopted. The methods that were adopted have been neatly summarized by Ramsay:

> The figures of acreage of crops and numbers of live stock are compiled from what are believed to be statements of fact collected by authority. The statements of produce of crops rest on estimates made by persons believed to be competent to do so. The statements of prices are based on the inquiries and judgment of reporters at selected markets taken as a representative sample.[39]

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[35] Board of Agriculture and Fisheries, *The Agricultural Output of Great Britain* (Cmd. 6277, London, 1912).

[36] Ministry of Agriculture and Fisheries, *The Agricultural Output of England and Wales, 1925* (Cmd. 2815, London, 1927); and Scotland Board of Agriculture, *The Agricultural Output of Scotland, 1925* (Cmd. 3191, Edinburgh, 1928).

[37] Board of Agriculture and Fisheries, *Agricultural Statistics, 1904; Report on the Agricultural Returns... in Great Britain*, xix–xx (Cd. 2594, London, 1905).

[38] Sir R. Henry Rew, "The Progress of British Agriculture," Royal Statistical Society, *Journal*, 85:17 (1922).

[39] Ramsay, "The Development of Agricultural Statistics," 126.

THE FENCING PROBLEM IN THE EIGHTEEN-FIFTIES

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Wherever livestock and vegetable crops are raised on the same farm it is part of the task of the agriculturist to protect the one from the other. Though the two forms of food production—animal and vegetable—are mutually interdependent, in certain respects they are also fundamentally antagonistic to one another. From this conflict necessarily follow two agricultural practices of great importance—herding and fencing. These tasks—old as agriculture—appeared in the European colonization of America almost from its beginning. Fencing practices developed in the earliest agricultural settlements in the United States. Institutions of enclosure appeared in the mature form as legislation in Virginia as early as 1632.[1] Always a heavy burden upon labor, fencing presents even more serious problems when the enclosing of fields is not to be achieved merely as one method of disposing of surplus timber. By the 1850s, the frequency with which the then already old question was asked—"What shall we do for fencing?"—is evidence that fencing was a most acute problem.[2] The difficulties of enclosing the western prairies with their sparse stands of timber in the face of labor scarcity, and the burdensome tasks of constantly maintaining and replacing the fences on the older farms of the East in the face of growing scarcity of farm wood supplies and of increasing lumber prices were the subject of constant discussion east and west, north and south.[3]

[1] Lewis Cecil Gray, *History of Agriculture in the Southern United States to 1860*, p. 145 (1933); P. W. Bidwell and J. I. Falconer, *History of Agriculture in the Northern United States, 1620–1860*, p. 21 (1925).

[2] Possibly the most dramatic phase of the history of the fencing problem in the United States was that of the Great Plains after 1870. Its story is told in Walter Prescott Webb, *The Great Plains*, 280–318 (1931), and Earl W. Hayter, "Barbed Wire Fencing—a Prairie Invention," *Agricultural History*, 13:189–207 (1939). Webb has pointed out that the "problem was pretty general all over the country" (*ibid.*, 283) which was certainly true for it was by the Seventies an old problem in all settled regions. Webb's statement regarding the fencing problem that "it was not until the Seventies, however, that the question attracted widespread public attention" (*ibid.*, 281) is inaccurate. In 1797, George Washington expressed concern regarding the fences on his farms and experimented with hedges and ditches. See Jared Sparks, ed., *The Writings of George Washington*, 12:332, 365, 371 (1837). In 1801, John Beale Bordley wrote: "A scarcity of timber and even of firewood, sensibly affects the apprehension of husbandmen in many parts of the country; and it increases rapidly. We may ask ourselves, how we are to inclose and divide our fields when in a few years timber shall be much more exhausted."—*Essays and Notes on Husbandry and Rural Affairs*, 195 (1801). In 1830, the *Western Agriculturist* declared: "Without fear of contradiction from our experienced farmers, I pronounce them to be the leak which prevents the filling up of our cup of bliss; as things are managed in our Western country, it is worse than a leak; it is a sore, a blotch, the course of perpetual discontent, the fretting leprosy of the land. Tell us how this is to be cured, and your book shall be immortal. . . . The mode of inclosing, as here practised and the urged necessity there is for the strongest fortification, in consequence of the barbarous practise of suffering stock of all kinds to run at large, keeps the farmer poor, and groveling and ignorant, and creates more rustic quarrels than any other thing, whisky not excepted." Cited in *American Farmer*, 12:257 (1830–31); John A. Warder, *Hedges and Evergreens*, 15 (1858); Joseph A. Caldwell, *Treatise on Hedging*, 22 (1870). The following anecdote bears on the point: "Tradition informs us that when the Heads of Departments at Washington were making out their inventory of the products of domestic industry, to be assessed and reported upon, in the census of 1850, their list was shown to the great statesman, John S. Calhoun, then nearing the end of his earthly career. After casting his penetrating eye over it, he replied with much warmth and emphasis, that they had omitted the most important item of the whole. 'What is that?' inquired his friend. 'Fences, fences' said he, 'They cost more and are of more importance to us, as an agricultural people than any other department of Domestic industry!' "—*American Cotton Planter* (n.s.), 2:54 (1854). Cf. also Fred A. Shannon, *Critiques of Research in the Social Sciences: III, An Appraisal of Walter Prescott Webb's The Great Plains: A Study in Institutions and Environment*, 79–82 (1940).

[3] "It has verily come to pass that no writer on agriculture or essayist, or lecturer at County or State

Interest in the problem of fencing was intense in the fifties. Few subjects received as much attention in the agricultural press of that decade. The rural journals gave much attention to estimates of the capital invested in fencing and to the costs of its maintenance. Their pages carried attacks on the enclosure laws which made fencing necessary and gave much space to suggestions and reports on experiments with new fencing methods. Here was the prelude to invention for it was this widespread interest in the problem and the virtually universal dissatisfaction with accepted techniques that led to a nation-wide groping for a satisfactory solution. It was these widespread experiments with new methods which constituted the background to the successful introduction a generation later of the fences of a metal age—barbed and woven wire.[4]

American farms were on the whole well fenced in conformity with the accepted view that an abundance of adequate fences was an indispensable adjunct to good and successful farming.[5] Indeed, the quality of enclosures was not uncommonly taken as a measure of the farmer's competence.[6] There was some criticism of fencing as excessive, though little as to lack of it,[7] and

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Fairs, or anywhere, can overlook the subject of *fences* and *fencing* without causing a shock of disappointment in the public mind. More and more anxiously every year now, are improved methods for fencing inquired for, whereby to lighten the labors and lessen the expense of enclosing the farm and protecting the crops." The writer cited evidence of the great popularity of the subject and then proposed that hedge fence journals be established similar to railroad and stock journals. See *Indiana Farmer*, 7:171 (1858–59).

[4] The barbed form was successfully introduced in the seventies, but the woven wire fence was not widely used until the nineties. Webb, *Great Plains*, 309; Hayter, "Barbed Wire Fencing—A Prairie Invention," 190–191; F. C. Gedge and E. Boley, History of the Manufacture of Woven Wire Fence (MS., American Steel and Wire Company, Industrial Museum, Worcester, Mass.).

[5] "It is no new thing to say that the proper inclosure of our farms is one of the rigidly indispensable facts with which, among others, the American husbandman has to deal. Whether we commence a farm in the woods or on the prairie, a substantial permanent inclosing of the cultivated ground is the first thing to be secured, if we keep teams and cattle, sheep or swine, as a part of our out-door economy. On purchasing a farm already subdued, the chances are three to one that immediate repairs of the old or a considerable outlay for new fencing have to be encountered, before the premises are thoroughly secure from the depredations of even our own animals, or from those of our lawless neighbors, which run abroad, free commoners, upon the highway—according to immemorial custom in this vaunted land of liberty and equality."—*American Agriculturist*, 18:13 (1859). "If there is any one thing more than another which is a source of constant anxiety and unremitting care to the farmer, it is the erection of suitable fences for enclosing his own grounds for the purpose of excluding lawless intruders, or keeping his own animals within proper bounds. Wherever a farm may be located, or whatever may be its production, *fence, fence, fence*, is the first, the intermediate, and the last consideration in the whole routine of the operations of the farm."—Edward Todd, *The Young Farmer's Manual*, 57 (1860). "Good and secure fences are better than a hot toddy, or all the soporific drugs of Turkey or Arabia, to sleep upon; you not only know where your cattle are, but where they are not."—*Rural New Yorker*, 7:69 (1856); "There are four things that all farmers should strictly attend to: 1st, good fences; 2nd, good cultivation in good time; 3rd, save all manure and everything that will fertilize the soil, and apply it in time; 4th, good care of and economy with all things."—*U. S. Report of the Commissioner of Patents, 1850, Agriculture*, 390. Cf. *Tennessee Farmer and Mechanic*, 2:164 (1857); *Michigan Farmer*, 12:34–35 (1854).

[6] "There is no feature in an agricultural district that is such a sure indication of finished husbandry as good fences of durable material."—*Boston Cultivator*, Apr. 12, 1851. "Among the permanent improvements on the farm, good fences are certainly first in necessity and importance. And while they are thus essential where a mixed husbandry is carried on, they are also unmistakably indicative of thrift and good order. Poor fences ever tell a sad story, and when we see a farm with fences all going to decay the conviction is irresistible that some shocking legend is connected with its history." *Ohio Farmer*, 8:72 (1859). "No man should think of planting a crop without throwing around it the protection of a good fence. Nothing fixes our estimate of a planter sooner than the character of his enclosures. . . . The protection of our hard earnings, as well as the freedom from care and anxiety demands that all shall be made safe in this department." *Soil of the South*, 4:2 (1854).

[7] Farms were not always perfectly fenced, of course, but the cropping of unfenced lands was confined largely to newly broken Western prairies. Such a practice was possible only where the population was very sparse and even then involved serious risks of crop losses. It was done only until the farm-maker could find opportunity and means to complete his fence. Cf. *American Agriculturist*, 15:74 (1856); *Country Gentleman*, 6:368 (1855); *New Hampshire Journal of Agriculture*, Oct. 20, 1860; *Ohio Cultivator*, 9:269 (1853), 10:282 (1854); *Plough, Loom and Anvil*, 6:328–329 (1852); *Rural New Yorker*,

much as to the quality of fencing.[8] The problem of insufficient fencing existed in well-settled areas chiefly in the case of railroad right-of-ways.[9] State governments were beginning to recognize this deficiency and to correct it through legislative action.[10]

The provision of the fencing that was thus deemed an essential part of farming was a heavy economic burden, "a perpetual tax on the farmer, inexorable as the taxation put on him by town, county, or State, and much exceeding it in annual amount."[11] It was, moreover, a burden that became increasingly severe, with the expansion of economic exploitation, extensively at the margin of settlement and intensively in increased pressure upon the resources of long-settled areas. Only where fences were a means of disposing of surplus rock or timber was the task of fencing a minor and relatively unimportant one.[12] In the older agricultural regions of the East, the constant maintenance and replacement of fences was always a heavy drain upon labor, and this burden increased with decreasing supplies of fencing materials.[13] Fencing was among the first problems to demand attention on the part of the settler carving a new farm from virgin land.[14] In the West

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7:69–70 (1856); 8:269 (1857); *Rural American*, 1:130 (1856); J. Richard Beste, *The Wabash; or, Adventures of an English Gentleman's Family in the Interior of America*, 1:165 (1856); James Caird, *Prairie Farming in America*, 50 (1859); William Ferguson, *America by River and Rail*, 321 (1856); John Reagan, *The Emigrant's Guide to the Western States of America*, 349 (1852). Fencing in parts of the South was criticized as inadequate. See *American Farmer* (ser. 5), 2:221 (1860–61).

[8] "No part of the economy of the farm has less attention paid to it than a proper division of the land into fenced fields of the right size in proportion to the whole." *Michigan Farmer and Live Stock Journal*, 14:68–69 (1856); 16:36–38 (1858); *Ohio Farmer*, 8:73 (1859). "No event in the management of the farm requires an exercise of more judgment and forecast, than a judicious arrangement of fences. The disbursement in this necessary labor is an immense item of the first and indeed annual expenditures upon a farm." New York State Agricultural Society, *Transactions*, 1854, p. 241.

[9] Ferguson, *America by River and Rail*, 321, reported that along the Little Miami Railroad alone, 1,600 cattle were killed within four years due to the lack of fence. The railroads were credited with the possession of 60,000 miles of fencing in 1865. See U. S. Department of Agriculture, *Annual Report*, 1865, p. 233. Railroad fence was apparently frequently of poor quality. See *Prairie Farmer*, 15:270 (185?); *Western Farm Journal*, 2:257 (1857); William Edward Baxter, *America and the Americans*, 43 (1855); George Tuthill Borrett, *Out West: A Series of Letters from Canada and the United States*, 110 (1866).

[10] Massachusetts enacted in 1846 what was apparently the first law which compelled railroads to fence against livestock; Georgia adopted such legislation in 1847, New York in 1850, Indiana in 1853, Illinois in 1854, and Ohio in 1859. See Ransom H. Tyler, *A Treatise on the Law of Boundaries and Fences*, 491ff. (1874); *The Fence: A Compilation of Facts, Figures and Opinion from National and State Agricultural Reports, Agricultural Journals, and the Public Press for the Past Sixty Years in Their Original Form Showing the Waste and Need of Fencing Material*, 11:21 (1875); *Ohio Farmer*, 8:388 (1859); *Scientific American* (n.s.) 1:229 (1859); *Southern Agriculturist*, 1:3–4 (1853).

[11] *American Agriculturist* (n.s.) 18:13 (1859). "It is safe to say that at least one month of the annual labor upon the farm in the western country, is expended in making and repairing the worm fences, with which they are enclosed and sub-divided." See *American Farmer*, 12:237 (1830–31).

[12] For the reasons given by an observer for the lack of interest in hedge fencing in Michigan, see *Michigan Farmer*, 12:34–35 (1854).

[13] "This is the heaviest work on a plantation and unfortunately must continue to be so for generations yet." See *American Cotton Planter* (n.s.) 1:223 (1857). In the South, however, fences were commonly built during the winter when there was little other work for plantation hands to do. See *Southern Cultivator*, 13:155–156 (1856).

"When a farm has more than one half of its land cleared, it is considered deteriorated, as being in a fair way to become short of fencing timber, the original settlers having, seemingly, had no notion that any would come after them as 'none had come before them'. . . . Many of the old farms are so short of fencing timber as to be obliged to beg or buy from their more fortunate neighbors. . . ." The reference is to Blount County, Tennessee. See Sidney Smith, *The Settler's New Home*, 119 (1850). "In a recent journey through the older parts of Georgia, we found many planters almost wholly dependent upon the second growth of pine for fencing material. The worthless rails made of this timber last but three or four years." See *Southern Cultivator*, 18:14 (1861).

[14] "In making a prairie farm, it will be readily admitted that the most important item and the one involving the heaviest outlay, is the erection of a secure and permanent fence, without which no man can be completely 'lord of his own soil.'"—*Illinois Farmer*, 4:367–368 (1859). "The great and general study of the prairie farmer is to contrive how to fence his land upon the large prairies."—*Plough, Loom and Anvil*, 8:26

where prairie was broken for cultivation, timber was frequently absent or available only at considerable distances creating serious handicaps in farm-making.[15] Such deficiencies required either that woodland or timber be purchased at a distance and the fence materials hauled when weather permitted or might even necessitate that they be purchased from northern forest regions.[16] In either case the money costs of farm-making were significantly increased.[17]

The importance of fencing may be illustrated from the contemporary estimates of the capital invested in this form of agricultural equipment. It was estimated that the value of fences in Pennsylvania in the 1840s averaged $700 per farm, a

(1856). "Fencing new grounds is one of the heaviest expenses the planter incurs."—*Carolina Cultivator*, 1:226 (1855–56). "Any one who will devise and give to the public a practical plan for a cheap, substantial, and durable fence, will confer a lasting and valuable benefit upon the inhabitants of our beautiful and fertile Western Prairie. One of the first items for consideration, as well as one of the most expensive items in the commencement of a prairie farm is the fencing."—*Tippecanoe Farmer*, 1:6 (1854).

[15] "It grieves us exceedingly to see the many disadvantages which some of our prairie farmers, especially the newer ones, labor under for want of suitable materials for fencing. Almost every expedient that can be devised, has been resorted to—almost every possible variety of fence, real or imaginary, good, bad, or indifferent may be found in perfection on our prairies; yet after ransacking the three kingdoms, under the spur of Yankee enterprise and ingenuity, much that is pretended fenced, is only half fenced, while a great deal is not inclosed at all. Simply for want of convenient materials.

"Under these circumstances it is very apparent that something decisive and effectual must be done by way of supplying this lack—that is, if we would have our country improved as fast as possible. Hence this matter of fencing becomes a subject of great importance and it behooves us to investigate it most thoroughly. . . ."—*Wisconsin and Iowa Farmer and Northwest Cultivator*, 2:49 (1850); "One of the obvious needs in our prairie country is the means of fencing."—*Indiana Farmer*, 7:171–172 (1858–59). Lack of fence materials was considered a serious obstacle to settlement of Illinois and other prairie States. Referring to Texas west of Guadalupe and San Antonio, General Hunter reported: "This country from its deficiency of wood must be doomed and set apart almost exclusively to the stock raising business till from density of population and rising value of land a resort will be had to hedging, wire fences and the use of coal which may be discovered convenient."—*Soil of the South*, 4:260 (1854). DeBow pointed out that "In many parts of the South, from the scarcity of timber, fences become an article of considerable annoyance and expense; which is especially the case on the prairie lands of Louisiana and Texas."—*Commercial Review*, 9:208–209 (1850). Cf. *Farmer's Journal*, 3:204 (1854); *New England Farmer*, 12:217 (1860); U. S. Patent Office, *Annual Report on Agriculture*, 1850, p. 403.

[16] Early settlers located as near timber groves as practicable. See Frederick Gerhard, *Illinois As It Is*, 355 (1857). Cf. Josiah T. Marshall, *The Farmer's and Emigrant's Handbook*, 402–403 (1852); John Reagan, *The Emigrant's Guide to the Western States of America*, 356–357 (1852); *Working Farmer*, 2:270 (1850).

Large areas in Illinois were fenced with timber from upper Wisconsin and Minnesota. See Indiana State Board of Agriculture, *Report*, 1854–55, p. 231. In reference to the regions about Peru, Illinois, one observer wrote: "Some newly settled farms were scattered about, with corn crops lying unfenced; some with post and rail fences—after a fashion—but where the posts and rails came from it would take a Yankee to guess. Again fields enclosed with post and board fence lay along the road. These fences came from Chicago."—*American Agriculturist*, 15:74 (1856). One of the benefits expected of the Illinois Central Railroad was that it would furnish the prairies with lumber. See Jacob Ferris, *The Great West*, 209 (1856); *Prairie Farmer*, 15:114–115, 287 (1855); *Northern Farmer*, 1:117 (1854).

[17] "We never realized so fully the expense and difficulty of fencing as when standing on those broad prairies . . . and remembered that these lands could be bought at such a price and on so favorable terms that the poorest man could possess himself of a home; but that the cost of fencing was so great, many were compelled to seek a home in the timber, where years of toil are necessary before a competence can be secured. Fencing in many places costs far more than the land and not only is this true, but fencing must be paid for in cash while the land can be bought on such terms that the money for the payments of both principal and interest can be realized from the land. The cost of fencing must necessarily be high as most of the lumber is brought from Green Bay, Saginaw, or some other timber region, to Chicago, and from thence is carried into the interior of the State by Railroad." The reference is to the Grand Prairie of Illinois. See *Rural New Yorker*, 8:269 (1857). "Fence making is an important item in prairie agriculture. When farms are opened at considerable distance from timber, the expense and difficulty of procuring rails are insurmountable."—Eliza W. Farnham, *Life in Prairie Land*, 216 (1855). "Fencing lies with special severity on the pioneer class who are least able to afford the outlay."—Horace Greeley, *What I Know of Farming*, 221 (1870).

total for the State of $100,000,000.[18] In New York the value of fences was calculated at $67,000,000 and averaged $900 per farm.[19] Ohio's fences were considered to cost an average of $250 per mile, or an aggregate investment of $115,000,000.[20] The importance of fencing in farm-making is illustrated in the case of Iowa which had $26,000,000 invested in the fencing which inclosed 4,784,000 acres in 1860.[21] The value of the fences in that State was estimated at about five times that of the value of all the livestock. Fencing was considered by some observers to be the greatest single form of capital investment in the country.[22] Estimates placed the capital invested in fences in the Nation at from $400,000,000 to $1,350,000,000.[23] The higher figure is probably the more accurate since the United States Department of Agriculture appraised the investment in fencing in 1871 at $1,750,000,000.[24] By way of contrast, the 1860 census reported the value of all farms as $6,645,000,000, the value of all implements as $246,000,000, and the value of all livestock as $1,089,000,000.[25] It was asserted that the costs of fencing in many cases exceeded the selling value of New England farms,[26] that "fences are to a prairie farm one-third of its value,"[27] and, with reference to Texas, "that the expense of fencing a farm is two or three times greater than the first

[18] Nicholas Biddle in an address before the Philadelphia Society for the Promotion of Agriculture. This address was of the greatest significance in calling attention to the heavy financial burden of fencing and stimulated the interest in the subject which was in evidence in the early fifties. See *Pennsylvania Farm Journal*, 3:359 (1853); *Valley Farmer*, 12:167 (1860); *Wool Grower and Stock Register*, 1:43–44 (1849); Massachusetts Board of Agriculture, *Annual Report*, 1861, p. 88–90; U. S. Department of Agriculture, *Annual Report*, 1871, p. 510; Solon Robinson, *Facts for Farmers*, 861–868 (1864).

[19] The estimate is based upon the assumptions that New York's 15,000,000 acres of enclosed lands were divided into fields averaging 20 acres each. This gives 750,000 fields requiring 120 rods of fencing each. The cost of fence is estimated at from 50 cents to $2 per rod, 75 cents being taken as a fair average. Robinson, *Facts for Farmers*, 861; also in American Institute of New York, *Transactions*, 1859–60, p. 269. Cf. *Wool Grower and Stock Register*, 7:106 (1856).

[20] *Ohio Valley Farmer*, 1:121 (1856). This is a moderate estimate. Three miles of fence are required to enclose and put two partition fences upon a quarter-section, and "no farm of a quarter section can be considered well fenced with less than five miles."—Ohio Board of Agriculture, *Annual Report*, 1854, p. 192. The *American Agriculturist*, 14:197 (1855), pointed out that "The cheapest plank fence and the commonest rail fence cost about the same—never less than $500 per mile. A good medium worm fence costs $600 per mile. A first rate rail worm fence and good post and rail fence cost not less than $700 per mile."

[21] Iowa State Agricultural Society, *Report*, 1859, p. 10, 138; William Duane Wilson, *A Description of Iowa and Its Resources*, 12 (1862). The Federal census of 1860 reported the total value of Iowa farms as $119,899,547, the value of all agricultural implements in the State at $5,327,033, and the value of livestock as $22,476,293. Eighth Census, *Agriculture of the United States 1860*, p. 50.

Other estimates of fencing investments include: Kentucky, $26,000,000,—*Valley Farmer*, 2:54 (1850); Maine, $25,000,000,—Maine State Board of Agriculture, *Annual Report*, 1859, p. 217, and Massachusetts State Board of Agriculture, *Annual Report*, 1861, p. 89–90; Maryland, $46,000,000,—*American Farmer*, 11:296 (1855–56); New Jersey, $21,000,000,—*New Jersey Farmer*, 2:129 (1856); Virginia, $40,000,000,—*Southern Planter*, 18:170–171 (1858).

These are all broad estimates. Detailed information regarding actual fencing is available for the agricultural township of Burrillville, Rhode Island. This town comprised 34,068 acres of which 16,262 were woodland. The fences consisted of 86,480 rods of stone wall and 105,530 rods of wood fence. There were thus 600 miles of fencing in an area of 53 square miles. See *Homestead*, 2:650–651 (1857).

[22] *Plough, Loom and Anvil*, 7:417 (1855); *Southern Planter*, 9:166 (1849); Indiana State Board of Agriculture, *Annual Report*, 1854–55, p. 235; Edwin T. Freedley, *Treatise on Business*, 74 (1852).

[23] *Genesee Farmer*, 19:241 (1858); *Valley Farmer*, 9:42 (1857); Mapes estimated $670,776,000 on the assumption that United States farms were divided into 20-acre fields with fencing costs at 50 cents per rod. This estimate gives a cost of $113.25 for each 20-acre field. See *Working Farmer*, 6:94 (1855). The estimate of $1,350,000,000 is by R. L. Pell. See American Institute, *Transactions*, 1851, p. 187–189; 1856, p. 508.

[24] U. S. Department of Agriculture, *Annual Report*, 1871, p. 510. Cf. also *Valley Farmer*, 7:424 (1856).

[25] U. S. Eighth Census, *Agriculture of the United States in 1860*, 184.

[26] *American Farmer* (n.s.), 1:52 (1859); 2:5 (1860); Freedley, *Treatise on Business*, 74.

[27] *American Agriculturist*, 16:278 (1857); American Institute, *Transactions*, 1859–60, p. 151, 153. Speaking of a 120-acre Wisconsin farm, one observer said: "It will be cheaply done if it does not cost $1000 to each farm on an average."—*Wisconsin Farmer and Northwestern Cultivator*, 9:116–118 (1857).

cost of the farm itself."[28] The complaint of California farmers that "when a man invests $1,000 here for land, he is required to invest $2,000 to fence it" was echoed by farmers throughout the Nation.[29] The country over, a dollar invested in livestock necessitated that another dollar be expended upon fencing; in farm-making regions a dollar invested in land required that two or more dollars be invested in fencing to make the land usable.

In addition to this investment and the interest upon it, fencing also involved heavy fixed costs for constant repairs and maintenance and above all the complete replacement of most wooden fences every twenty or twenty-five years if not more frequently.[30] The farm fences of Massachusetts were judged to involve an annual cost of $125 per farm.[31] It was estimated that repairs to fences cost the farmers of the Nation $135,000,000 annually and replacements an added $52,000,000.[32]

Though fencing was recognized as a "great burden to agriculture everywhere" it was on the whole acknowledged as a necessary and unescapable evil. Accepted enclosing practices had once been merely matters of custom, but they were customs which, by the 1850s, were thoroughly embedded in the mores of agricultural living as well as in the law.[33] To most observers the fencing problem was to be solved only by reducing costs and consequently by finding new and cheaper fence materials for the timber-poor West and the increasingly timber-poor East. There were, nevertheless, differences between regions—those long-settled and newly-settled, timber-rich and timber-poor, grain-raising and grazing—which led to some

[28] *Plough, Loom and Anvil*, 7:417 (1855).

[29] W. H. Parks, in California State Agricultural Society, *Transactions*, 1868–69, p. 305, cited in U. S. Department of Agriculture, *Annual Report*, 1870, p. 516. Parks went on to say: "Almost every man who desires has the means and ability to acquire a small farm in this country; but there are those who cannot acquire even a small farm and fence it as required by law. In other words, one man with six or eight cows perhaps will come into a neighborhood, and prevent ten men from producing a thousand bushels of wheat each. In my opinion it is most absurd. There is no reason why one individual should pursue an occupation to the great injury of hundreds of others, no reason why A should be compelled to build *two miles* of fence that he may raise three hundred bushels of grain, to accommodate B, who milks three cows. Let B take care of his own cows; let him fence ten acres, or in other words, let him keep his property from trespassing on mine.

"This question is just commencing to be agitated, because perhaps stock keepers have heretofore predominated, and it would have cost more to fence the stock than the grain; now the thing is reversed, and it costs ten, yes twenty times the amount to fence the grain than it does the stock."

[30] Opinion on this matter varied greatly. Common estimates gave rail fences a life of eight to ten years, and twenty years for post and board. *American Agriculturist*, 9:156 (1851); 18:234 (1859); *Southern Cultivator*, 13:155–156 (1855); *Valley Farmer*, 2:54 (1850); *New England Farmer*, 12:456 (1860); Massachusetts Board of Agriculture, *Annual Report*, 1861, p. 89–90; New York State Agricultural Society, *Transactions*, 1850, p. 519.

[31] Massachusetts Board of Agriculture, *Annual Report*, 1861, p. 90. An annual cost per farm of $130 to $140 is given in the *Wool Grower and Stock Register*, 1:43–44 (1849).

[32] American Institute, *Transactions*, 1859–60, p. 264–268. Cf. *Valley Farmer*, 2:54 (1850); *Northern Farmer*, 1:319 (1854).

[33] "Our fence system has been gradually engrafted upon the people by accidental circumstances, growing out of the necessity of early settlers, who fenced around the first cleared fields and let the stock run in the woods. Laws made at first to protect such settlers have been continued and men educated to bear the heavy burden they have entailed, until they appear to love the law, or rather the custom that forces them to pay such a penalty.

"The Universal custom, and not the law—for really there is no such statute—has led men to believe that every owner of land is bound to fence all the world out, and that it is no trespass upon the rights of property to enter upon any uninclosed lot and despoil it of half of its value." The author goes on with reference to Western lands: "If the law, or custom, which is stronger than law, were for every man to keep his own stock within his own boundaries, instead of fortifying himself to keep everybody's stock out of his fields, a poor man could go upon the Western prairies without a dollar of capital and take up public land and have it plowed, on credit, to be paid for out of the crop or by his own labor, and thus could in a few years become the owner of a good farm. He is kept out of this enviable position, because custom requires him first to fence his fields and then plant them. To do this is impossible without capital. The lowest cost would be one dollar a rod, making the expense of inclosing one eighty acre lot four hundred and eighty dollars. In many places it will cost twice that. Then custom requires division fences, say four twenty acre lots making a total of seven hundred and twenty dollars for fencing a lot that cost but eighty dollars for the soil." Solon Robinson, *Facts for Farmers*, 863–864 (1864); cf. Maine Board of Agriculture, *Annual Report*, 1861, p. 23–27.

differences in the approach to the problem. All areas shared the search for some cheaper substitutes for the common forms of fencing; but in addition there was some agitation, particularly in the East, for modification and change in the legal requirements governing enclosures and liability for stock damage.

Under English common law there exists in precept no obligation to fence, but instead the owner of livestock is legally bound to restrain them, is answerable for their trespasses, and, in effect, is obliged to keep them within enclosures.[34] The cultivator of crops is under no obligation to fence out the animals of his neighbors.[35] Though most American basic law is English common law in origin, the common-law principle relating to crops and livestock was inappropriate when applied to conditions of land settlement such as existed in the English colonies of America and continued to exist at the margin of the westward movement of agricultural settlement until toward the close of the nineteenth century.[36] Had the English common law been applied, without modification, the American farm-maker would have been denied the opportunity to permit his animals to run at large and so to make use of the vast areas of virgin forest and grasslands which in all early stages of settlement surrounded the cultivated lands.[37] In effect, livestock raising would have been greatly restricted, if not entirely curtailed. Under farm-making conditions as they existed in the United States, any land not enclosed and not planted in crops was for economic reasons looked upon as proper pasture ground for livestock, regardless of the ownership of the land. It was treated as commons, such treatment extending also to roads and highways. The legal requirements of a new country are thus quite different and, in fact, the reverse, of the needs of a well-settled and mature country. The result was a treatment of unenclosed lands as commons which was in direct conflict with accepted common-law concepts of individual property rights.

The applicability of the English common law to American conditions was specifically or directly denied in only a few States.[38] Illinois and Iowa, for example, denied the applicability of the English law in their territories by statute. Such was also the case in Alabama and a few other States which had the opportunity to profit from the experience of older States. Judicial decisions, however, achieved the same results almost everywhere else. A few States took the extreme position of granting the right of commons by statute. Indeed, the statutes of California and Texas went a step farther and provided for damages to the owners of livestock whose animals might be injured by eating crops that were not adequately fenced or by the efforts of the owner of such crops to remove the animals from his fields.

More significant and universal than legislative reversal of common law was the fact that the statutory enforcement of the custom of commons consisted of amendments made to the body of English common law pertaining to fencing, which had the effect of reversing the economic impact of that law. This reversal was effected in many States by statute and in a few by judicial decision. A few States specifically required fences around cultivated fields, and the majority had statutes which provided in general that if damages were

[34] On the law of fencing and enclosures see: Ransom H. Tyler, *A Treatise on the Law of Boundaries and Fences* (1874), especially p. 341–347; Arthur Joseph Hunt, *The Law Relating to Boundaries and Fences*, ch. 2 (ed. 2, 1870); R. G. Nicholson Combe, *Hunt's Law of Boundaries, Walls and Fences*, 95ff. (ed. 6, 1912); Humphry W. Woolrych, *The Law of Party Walls and Fences*, 285ff. (1845); Ray Hamilton, *The Legal Elements of Boundaries and Adjacent Properties* (1930).

The laws of the various States governing fencing received considerable attention in agricultural literature. See Joseph A. Caldwell, *Treatise on Hedging*, 194–227 (1870); American Institute, *Transactions*, 1859–60, p. 264–268; Massachusetts Board of Agriculture, *Annual Report*, 1859, p. 311–316; U. S. Department of Agriculture, *Annual Report*, 1869, p. 394–410.

[35] Judicial recognition of an obligation to fence against commanable rights of pasture and statutory obligations requiring fencing against turnpikes and railroads modified the application of the rule in England but the basic principle remained. Cf. *Hunt's Law of Boundaries*, 98–99, 100–101, 113–115; and Woolrych, *The Law of Party Walls and Fences*, 292–306.

[36] Bidwell and Falconer, *History of Agriculture in the Northern United States*, 21; Gray, *History of Agriculture in the Southern United States*, 143–146, 380.

[37] The Supreme Court of Iowa, in holding the common law inapplicable to that State argued that "from the scarcity of timber, it must be many years before these extensive prairies can be fenced; and their luxuriant growth sufficient for thousands of cattle, must be suffered to rot and decay where it grows, unless settlement upon their borders are permitted to turn their cattle upon them."—*Iowa Reports*, 3:396. Cf. *ibid.*, 402, 405.

[38] The following analysis is based largely on Tyler, *Treatise on the Law of Boundaries and Fences.*

to be collected in compensation for the ravages of trespassing livestock, the plaintiff had to prove that his crops were protected by a "legal fence." Statutes sometimes defined the fence that would meet legal requirements, but frequently left such definition to local custom and usage as interpreted by the courts. The functions of ascertaining the existence of a legal fence in case of judicial dispute were sometimes carried out by a special official, the "fence-viewer," but were sometimes made the duty of other officials or groups of officials.

Fencing requirements differed widely as between the States, but in a broadly generalized sense the following types of fence regulations were in effect in the 1850s:

1. Judicial recognition of the right of commons as a customary one; fencing required by the courts to maintain a suit for damages of trespass.
2. Judicial recognition of the right of commons; fencing required by statute to maintain a suit for damages.
3. Statutory recognition of the right of commons and statutory requirement of legal fences to maintain a suit for damages.
4. Statutory recognition of the right of commons; legal fences around all cultivated crops being required specifically by statute.
5. Statutory denial of the right of commons, but fences required by courts to maintain a suit for damages.
6. Statutory denial of commons with statutory requirement of legal fence to support a suit for damages.
7. Statutory denial of commons accompanied by statutory requirement of fencing around all cropped land.[39]

In addition, some States granted their local governmental units the right to determine fencing regulations in their jurisdictions.

In general, in the grain-growing districts, the common law tended to be recognized, and fences were required to keep cattle in; in grazing areas the right of commons was accepted and fences were required to keep cattle out of cultivated crops.[40] This difference existed also within certain States such as Illinois where the right of commons was denied in the grain-growing areas as the result of the exercise of local option. Whether fences were looked upon as intended to avert the destruction of crops by trespassing animals or to restrain a man's own stock from similar depredations, the effect was in every case the same. It was everywhere an obligation upon the cultivator of cropped land to build and maintain fences which would meet statutory and judicial concepts of adequacy.

The economic conditions which determined the development of the laws which made fencing against commons obligatory ceased to exist whenever the processes of settlement had advanced so far that the cost of fencing animals out of tillable fields came to exceed the cost of fencing them within their own pastures. Economically the existence of a mature settled society called for fence legislation which placed the burden of controlling livestock squarely upon the owners of the animals.[41] This change in economic requirements

[39] This classification is highly tentative and is presented in the hope that it will attract the attention of legal historians to the very interesting changes in common law as a result of the impact of economic necessity in the American States.

[40] "It is curious to observe how differently the great question, that of the Common Law, with regard to inclosures, is viewed in the different states, according to the character of their agriculture respectively: just as grazing or grain-growing prevails, we find the fences are legally considered inclosures for the cattle or barriers against them."—Warder, title 144.

[41] "In the early settlement of a country, when the cultivated fields are small, and the pastures embrace the wide range of all beside, it is true economy to protect the fields and let the stock run at large; but when a county be once thickly settled, and the pastures form less than half the occupied lands, then the order should be reversed; the pastures should be inclosed, the stock confined in them, and the fields should be allowed to live unfenced. There can hardly be a necessity for inclosing both. We call the attention of farmers to this subject, for them to inquire if their labor cannot be more profitably employed than in the building and keeping in repair of these long lines of fences."—*Maine Farmer*, Feb. 3, 1859. "There is scarcely a planter or farmer in the United States who has not seen and felt the heavy tax to which American agriculture is subjected by reason of that early colonial system of compelling every cultivator to fence his crops, instead of requiring every owner of livestock to keep them out of his neighbor's cultivated fields. We will not say that our forefathers did wrong at a time when the area under tillage was comparatively small, fencing timber abundant, and a wide common range for hogs, neat cattle, and other domestic animals, was very desirable in a new country. Under such circumstances they might wisely and properly dispense with the ancient common

had occurred by the 1850s in all the Eastern Seaboard States and probably in large sections of such States as Ohio, Alabama, Tennessee, Illinois, and Michigan. Judicial and legislative recognition of such changed conditions was, however, slow, particularly in the face of the argument that the "long pasture" made possible the keeping of livestock by the poor who required a cow or two but owned no land. There was also apparent in some States a judicial tendency toward restriction or prohibition of the commons right, based upon the conflict which existed between the common-law concept of property rights which prohibited trespassing and the right to commons which was in essence trespass.[42] Likewise, in some States the power to exercise or prohibit commons was delegated by statute to local jurisdiction; in some, certain animals were ordered enclosed while others were granted commons rights. Complete freedom of commons continued in the 1850s to be the usual condition in the South and West.

In some of the older States which retained the frontier type of fence laws, there existed in the fifties strong demands for changes in the law whereby stock would be fenced in and crop lands permitted to go unfenced.[43] Agitation against stock running at large was important in Ohio, Indiana, Maine, North Carolina, and other States.[44] The movement for reform of the old fence laws was particularly important in Virginia where agitation had been strong since the thirties.[45] Critics of the fence laws of Virginia declared that the fences required an investment and represented maintenance costs which were ruinous to farm investments.[46] They described the Virginia situation as one of a "system of individual defence,"[47]

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law principle that a man's premises are not to be invaded by another man, nor by another man's stock as a right belonging to the latter, fence or no fence. A moment's reflection will satisfy any one that to give one man's cattle the privilege to graze upon and occupy another man's land is an invasion of the rights of property only to be justified by the clear attainment of a higher public good."—Dr. Daniel Lee, in *Southern Cultivator*, 13:73–74 (1856). "The original base of all the fence laws in the Union upon which the supremely ridiculous laws of the present age have been built, was made to suit the condition of a sparse population, living in the wilderness. How any people whose condition has changed so much as those of lower Virginia, or the upper part of Delaware, or the central part of New Jersey, or southern portion of New York, or nearly all New England, since the original fence law was made, can endure the tyranny of the present law, or that they do endure and re-enact them is past our comprehension."—*Plow*, 1:274 (1852). Cf. *Ohio Cultivator*, 16:360–361 (1860); *Homestead*, 4:1004–1005 (1859); *Rural New Yorker*, 10:85 (1859); *Northern Farmer*, 5:242–245 (1858); Maine Board of Agriculture, *Annual Report*, 1859, p. 23–27; Robinson, *Facts for Farmers*, 863.

[42] For example, the New York case of Holliday v. March, 3 *Wendell* 142–147, reported in *Indiana Farmer*, 1:265–266 (1851), and *Wool Grower and Stock Register*, 6:91 (1854). See also 12 *Wendell* 9; 2 *Cowen Reports* 78; 12 *Johnson Reports*, 433; *Cowen's Treatise*, 1:423–430.

[43] Such agitation was not, of course, new but had appeared in many of the older States toward the close of the eighteenth century. Cf. Gray, *History of Agriculture in the Southern United States*, 146.

[44] Alabama: the premium essay at the West Alabama Fair, 1859, "On the Propriety and Policy of Abolishing Fences and upon what conditions and Terms the Same May be Done," *American Cotton Planter* (n.s.), 4:358–362 (1860).

California: "Report of the Committee on agriculture regarding petition of citizens praying repeal of all laws requiring fences for the protection of crops, and enactment of a law allowing damages to full amount of stock depredations on growing crops." California, *Assembly Journal*, 1856, p. 360–361; cf. California State Agricultural Society, *Annual Transactions*, 1863, p. 146–155.

Carolinas: *Carolina Cultivator*, 1:226 (1855); South Carolina State Geologist, *First Annual Report*, cited in *Farmer's and Planter's Monthly*, 11:71 (1860).

Indiana: *Indiana Farmer*, 1:265–266, 181 (1851); 2:6 (1852); American Institute, *Transactions*, 1859–69, p. 264–268.

Iowa: *Iowa Farmer*, 4:12 (1856); *Prairie Farmer*, 12:199–200 (1852); Iowa State Agricultural Society, *Report*, 1859, p. 128–134.

Maryland: *American Farmer*, 11:296 (1855).

Ohio: *Northern Farmer*, 1:319 (1854); *Ohio Cultivator*, (1857), 16:68 (1860); *Ohio Farmer*, 8:69, 82 (1859); *Ohio Valley Farmer*, 1:121 (1856); Ohio Board of Agriculture, *Report*, 1855, p. 18–19; 1857, p. 12–13; 1859, p. xv.

Wisconsin: *Prairie Farmer*, 14:324 (1854); Wisconsin Agricultural Society, *Transactions*, 1860, p. 342.

[45] Gray, *History of Agriculture in the Southern United States*, 843.

[46] "Does not every neighborhood contain some large estates in the hands of a wealthy proprietor, composed of these small freeholds which have been worked without a profit and sold at a sacrifice because the labor of fencing was too great a tax upon their poor proprietor?" *Southern Planter*, 12:200–201 (1852). See also *ibid.*, 137, 230–235; 10:111–112 (1850); 11:29–30 (1851).

[47] *Farmer's and Planter's Monthly*, 11:71 (1860). Cf. *Genesee Farmer*, 19:23 (1858).

pointed out that "all Virginia is declared a common except such portions of its arable surface as has a line of fortifications around it,"[48] and asserted that the argument which defended enclosures by pointing to the need of the poor for free range overlooked the enormous costs of fencing to the poor as well as to everyone else.[49] Edmund Ruffin was among those who suggested that the law be reversed so that a man's stock had to be fenced in rather than that the stock of others be fenced out.[50] The result of the agitation against the existing laws in the State was limited chiefly to the legalizing of an experiment in "farming in common" whereby the farmers of Prince George County undertook to fence in all their stock and to let their cultivated fields lie unfenced.[51] Similar agitation in other States enjoyed no greater success.

In these and other States where stock was permitted to run at large, the cost of fencing was sometimes reduced by mutual agreements within a neighborhood to enclose hogs and sheep and to build a cheaper fence which would be adequate to restrict cattle and horses.[52] A German settlement in Texas cultivated 8,000 acres which were fenced in common.[53] In Ohio, one fenced enclosure included a dozen farms in a tract of 2,000 acres,[54] and the practice was also followed in Illinois,[55] though it cannot be considered common.

[48] *Southern Planter*, 12:201 (1852). Cf. the report on the fence law to the Brunswick Agricultural Society, March 1853, in *ibid.*, 13:237–238 (1852).

[49] *Southern Planter*, 9:38 (1849); 10:90, 111–112 (1850); 11:29–30 (1851); 12:137, 200–201, 230–235 (1852); 13:182–184, 237–238 (1853). See also *American Agriculturist*, 9:156 (1851).

[50] *Southern Planter*, 11:281–282 (1851); 12:35 (1852).

[51] For the text of the law passed in January 1858, see *Southern Planter*, 18:168–170 (1858). On the progress of this experiment, see Edmund Ruffin, *Agricultural, Geological and Descriptive Sketches of North Carolina*, 91 (1861). See also *Southern Planter*, 10:216–218 (1850); *American Cotton Planter* (n.s.), 4:358–362 (1860).

[52] E. g., Whiteside Co., Illinois. See *Valley Farmer*, 3:324 (1851); *American Agriculturist*, 16:278 (1857); *Genesee Farmer*, 19:23 (1858).

[53] *American Cotton Planter* (n.s.), 2:37 (1858).

[54] U. S. Department of Agriculture, *Report*, 1871, p. 505.

[55] "Farms here generally retain their full dimensions, quite often being fenced in with others, so that one field contains several hundred or thousand acres without cross fences. This is not so inconvenient as it would first seem as the whole inclosed area is usually plowed or sown. The open prairie is our pasture."—*Rural New Yorker*, 9:374 (1858).

Another method of achieving economy in fencing was that of placing the stock of an area in charge of a shepherd, a method largely confined to prairie regions. In Iowa shepherding was a statutory requirement for sheep grazed on the prairie.[56] Shepherding of stock was also practiced on Long Island, but the high costs of labor prevented the spread of such a system.[57]

Efforts looking toward reform in fence laws were of greatest success in the East where such changes had greatest economic justification and where there was little resistance to such change save social inertia. Even then, however, laws requiring livestock to be fenced were frequently unenforced or unenforceable. The custom of allowing animals to run at large on highways or streets—on what was called the long lot or long pasture—was tolerated practically everywhere with the exception of Massachusetts where the law prohibiting commons seems to have been well enforced.[58] Hogs and cows were described as having free range of the streets of New York City. "Hardly a month passes that the newspapers do not record accidents to women and children—ground or trampled upon in the very park in front of the city hall itself."[59] Cincinnati, the Nation's Porkopolis, was notorious for its free-lance hogs—animals which had escaped from droves being taken through the city streets and then apparently lived for long periods in the streets without disturbance. There were no enclosed pastures about Washington and "droves of cows and hogs by hundreds rambled at will over the unimproved grounds about the city."[60] Hogs running at large were an "intolerable nuisance" at Bangor, Maine.[61]

The legal requirements regarding fencing were

[56] This requirement was given as a reason for the slight development of sheep raising in Iowa and other Western States. See *Genesee Farmer*, 19:23 (1858).

[57] American Institute, *Transactions*, 1851, p. 186.

[58] *Ohio Farmer*, 8:226 (1859).

[59] *Working Farmer*, 3:249 (1851).

[60] "As to swine, they are in the streets, upon the sidewalks and everywhere else. What the Irishman said of Cincinnati might be said with equal truth of Washington, that every third man one meets is a hog."—*New England Farmer*, 7:86 (1855).

[61] *Maine Farmer*, Oct. 28, 1852; *Indiana Farmer*, 1:265–266 (1851).

largely concerned with road and property-line fences.[62] In addition, American farming custom required that the farm be divided into a number of fields, each one fenced. Such fenced areas were desirable to economize labor in respect to the care of livestock. A minority of observers held that the amount of fencing in existence far exceeded the legal requirements, and some argued that although farm division fences were to a degree indispensable such fences in actual number exceeded all necessity.[63] Such critics urged the feeding of stock in yards, i.e., soiling, which they asserted was better husbandry, economical of manure and also of fencing.[64] Such criticism had apparently little effect; the scarcity of labor was such as to outweigh the burden of fencing, and suggestions which sought to reduce fencing by increasing labor requirements were not solutions to the problem.

Changes in legal requirements, even where desirable and obtainable, could do no more than reduce the fencing requirements somewhat and thus, to a small degree, alleviate the problem. The fencing question remained and could apparently be successfully attacked only by securing some new and cheaper methods of enclosing or some new material. It was in this direction that the fencing problem aroused the greatest interest.

The varieties of fences were very numerous.[65] In the first state of settlement upon heavily forested land where no market existed for the timber, the brush or log fence was perhaps the most common. This consisted simply of logs rolled upon one another, held in place at the joinings by saddles formed of sections of smaller trees. Since such a fence could be built for about the same effort that was required to burn the surplus timber, its cost was negligible.[66] With increased density of settlement, expansion of the farming area, rising timber values, and the decay of the log fences, other forms appeared. Where wood was easily obtainable, the Virginia rail, zigzag, snake, or worm-rail fence, as it was variously known,[67] was by far the most common and economical. Consisting merely of unfinished rails split from logs laid one upon another in sections which supported each other, it was a type of fence which was very economical where timber was abundant, since it required no posts or holes.[68] In the 1850s "in most of the newer portions of the country, the old-fashioned zigzag fences still prevail, and where timber is abundant, do not cost one-third the amount required for good post-and-board fence."[69] Nine-tenths of the fences in most parts of New

[62] Considerable legislation existed regarding the liability of adjoining property owners to build and maintain fences on property lines. A New York law of Apr. 18, 1838, denied to a person liable to contribute to the maintenance of a division fence all right to damages incurred by reason of his portion of such being out of repair. See American Institute, *Transactions*, 1859–60, p. 264–268.

[63] Richard L. Allen said: "Unfortunately custom in this country has increased them beyond all necessity and reason." See *American Farm Book*, 284 (1849). Cf. *American Agriculturist*, 16:4 (1857); 18:234 (1859); *Connecticut Valley Farmer and Mechanic*, 2:97 (1854); *Country Gentleman*, 2:390–391 (1853); *Michigan Farmer*, 16:36–38 (1858); *New England Cultivator*, 4:82, 217–218 (1853); *New Hampshire Journal of Agriculture*, Apr. 7, 1859; Robinson, *Facts for Farmers*, 263–264.

[64] "By soiling it has been demonstrated that three animals can be better kept upon the same land, than one suffered to run at large—that the expense bears no proportion to the gain in land and stock, while the saving in the expense of keeping up fences is of itself a profit. The sowing of corn to be cut green and fed to cows in dry weather—a practice becoming very common—is but a rude system of soiling."—*Wool Grower and Stock Register*, 7:106 (1855). See also *Carolina Cultivator*, 1:322–323 (1855–56); *Pennsylvania Farm Journal*, 1:304–305 (1851–52); American Institute, *Transactions*, 1853, p. 319, 330; Maine Board of Agriculture, *Annual Report*, 1859, p. 217; U. S. Patent Office, *Report on Agriculture*, 1857, p. 442; 1859, p. 447–448.

[65] "In New England there are more than fifty different kinds."—*Maine Farmer*, June 28, 1855. Varieties were even more numerous in the West. For descriptions of the principal forms of fence, see Edward Todd, *The Young Farmer's Manual*, ch. 2 (1860); also published separately as *A Treatise on Fencing* (1859); a series of articles on "Farm Inclosures" in *American Agriculturist* (n.s.) 18:13ff. (1859); Michigan State Agricultural Society, *Transactions*, 1851, p. 235–250.

[66] *Rural New Yorker*, 6:213, 221, 229 (1855); *American Agriculturist*, 18:13 (1859); *Northern Farmer*, 5:69 (1858).

[67] Henry A. Murray, *Lands of the Slave and the Free; or Cuba, the United States and Canada*, 1:39 (1855); *American Agriculturist*, 16:277 (1857); 18:234 (1859); *Genesee Farmer*, 18:214–215 (1857); *Rural New Yorker*, 6:213 (1855).

[68] *American Agriculturist*, 18:175 (1859); *Cultivator* (ser. 3), 3:243 (1855); *Rural New Yorker*, 6:126 (1855); *Prairie Farmer*, 10:111 (1850).

[69] *Illustrated Annual Register of Rural Affairs*, 1858, p. 120.

York were reported as common stake-and-rail.[70] It was observed that "This mode of fencing causes the whole country to look like one prodigious wood-yard."[71] Estimates of the cost of this fence ranged from 50 cents to $1 a rod which, though cheaper than other forms of fence, were by no means negligible sums.[72] By the fifties, the Virginia fence had become in many areas the most costly type to build, even in wooded regions. It was described as being the least common form of fence in many parts of the State from which it received its name.[73] Rails were becoming scarce in parts of New York,[74] and this type of fence was denounced by some as an unwarranted waste of an increasingly scarce material.[75] It was also in many ways an unsatisfactory fence. It was easily blown down by the wind, the danger of destruction by fire was serious, it suffered rapid depreciation and required constant care, it was extremely wasteful of land,[76] and it encouraged the growth of weeds which were very difficult to control.

As Eastern agriculture passed out of the pioneer stage, the common successor to the rail fence, and also its chief alternative in timber-poor areas, was the post-and-board or post-and-rail fence.[77] This was more economical of both timber and land,[78] but since it required more labor in manufacture it was also more expensive. It was probably the most common fence in eastern Pennsylvania and in Virginia,[79] and was very common in the prairie regions where wood was scarce.[80] Although estimates vary considerably, this type of fence cost on an average at least 25 percent more than did the rail fence, or $1 to $1.25 per rod. Rapid decay of the posts was its chief disadvantage.[81]

Among other fencing materials, stone was perhaps the most important. Stone walls were widely used wherever the raw material was superabundant in New England, the stone being built into fences to get rid of it, much as logs were used

[70] *Valley Farmer*, 2: 146 (1850). "The fences common in Illinois, and throughout the west generally are the Virginian, zigzag, or worm fence, sod fence, sod and rail fence united, and in the centre of the prairie, where timber is distant, the board and picket fence."—Regan, *Emigrant's Guide to the Western States of America*, 347. The *Indiana Farmer*, 2:292 (1852) said that nineteen-twentieths of western fences were of rail. Cf. *ibid.*, 5:344 (1856); *American Agriculturist*, 9:156 (1851); *Country Gentleman*, 2:37 (1853); 3:206 (1854). For estimates as to the forms of fences common to various sections in 1870, see U. S. Department of Agriculture, *Report*, 1871, p. 499–508.

[71] James Dixon, *Personal Narrative of a Tour Through a Part of the United States and Canada*, 32 (1849).

[72] Costs cited for this and other forms of fences are quoted from: *American Agriculturist*, 15:173 (1856); 18:110–111, 175 (1859); *Country Gentleman*, 3:206 (1854); *Indiana Farmer*, 1:361–362 (1851); *New England Farmer*, 7:141–142 (1855); 12:456 (1860); *Ohio Valley Farmer*, 1:31 (1856); *Plough, Loom and Anvil*, 6:32–34 (1855); *Rural New Yorker*, 1:81 (1850); 5:344 (1854); 7:222 (1856); 9:81 (1858); *Soil of the South*, 2:359–361 (1852); *Southern Cultivator*, 13:155–156 (1856); *Southern Planter*, 18:170–171, 434 (1858); *Valley Farmer*, 5:361–362 (1853); *Western Journal and Civilian*, 2:383 (1850); *Working Farmer*, 5:107 (1853); *Homestead*, 1:770 (1856); American Institute, *Transactions*, 1859–60, p. 264–268; Indiana State Board of Agriculture, *Annual Report*, 1854–55, p. 231; New York State Agricultural Society, *Transactions*, 1851, p. 226, 235–236, 242, 519; Pennsylvania State Agricultural Society, *Transactions*, 1859, p. 49; Ohio Board of Agriculture, *Report*, 1855, p. 275; Dana, *The Great West*, 217; Horace Greeley, *What I Know of Farming*, 222 (1871); Gerhard, *Illinois As It Is*, 311–312. Cf. also U. S. Department of Agriculture, *Report*, 1871, p. 508–509.

[73] *American Agriculturist*, 18:175 (1859); *Cultivator*, 3:243 (1855); *Rural New Yorker*, 7:126 (1856).

[74] *Maine Farmer*, July 8, 1852.

[75] *Rural New Yorker*, 3:41 (1852); 6:213 (1855).

[76] In a 100-rod length it rendered a mile of land 1 foot wide useless. See New York State Agricultural Society, *Report*, 1850, p. 328; *Homestead*, 2:58 (1857). Its estimated life was from six to eight years though as much as twenty years was claimed for it. See American Institute, *Transactions*, 1851, p. 186–187; Freedley, *Treatise on Business*, 74; *Southern Cultivator*, 16:120–121 (1858).

[77] "The most of the fence now built is of posts and pine boards. Of that older, much is of stakes, some palings, and some of rails; which is, however, pretty scarce and will soon be a curiosity." *Prairie Farmer*, 14:132, 165–166 (1854); *Country Gentleman*, 3:93 (1854); *Genesee Farmer*, 18:214–215 (1857); S. H. Collins, *Emigrant's Guide to the United States of America*, 15 (1829); Gerhard, *Illinois As It Is*, 311.

[78] "The amount of white oak required to enclose a tolerable sized field with a six rail fence, would, if sawed and split, furnish posts sufficient for ten times as much board fence; and the amount of land saved along its line would at least partially aid in paying for the other necessary material."—*Genesee Farmer*, 20:16–17 (1859). Cf. *Rural New Yorker*, 6:213 (1855).

[79] *Cultivator* (n.s.), 9:50 (1852); *Country Gentleman*, 3:93 (1854).

[80] *Indiana Farmer*, 5:361–362 (1856); Indiana State Board of Agriculture, *Report*, 1854–5, p. 231.

[81] *Homestead*, 2:58 (1857).

for fences in the initial clearing of a forested area.[82] Though stone walls were fairly permanent, they had to be built with care,[83] and were not free of maintenance problems. They were considered expensive, requiring two to three times more labor than did rail fences. Stump fences were occasionally used, particularly in exhausted lumber-producing regions, though stumps were more often permitted to rot in the ground.[84] Sod fences were employed in parts of the West, but they were not considered satisfactory and there was little spread of this form of fence.[85] Banks were occasionally advocated as fences as were also ditches, the latter frequently in association with other forms.[86]

Though some interest was aroused in better methods of using timber in fencing and also in methods of preserving timber, neither was a significant addition to the attack on the problem. Instead interest concentrated upon two new techniques: hedging and fencing with wire.

Of these two, hedging or "live fences" commanded the greatest attention during the fifties. This was particularly true where the fence problem was the most pressing—the Prairie States of Illinois, Iowa, and Missouri. Ohio was, however, the center of the hedging movement, with the East and South only slightly less interested in live fences than the West. In the East, hedging had attracted attention as early as 1800,[87] suggested no doubt by the popularity and success of hedge fencing in England,[88] and the English precedent itself, no doubt, brought hedging a certain amount of support. So serious was the fencing problem west of Ohio and so completely did the possibility of growing the necessary fences on the soil captivate the public mind that the middle fifties witnessed what was justifiably described as a "hedge mania."[89] The notion of a permanent "living fence" had a vast appeal in timber-poor areas.

A wide variety of plants was suggested at one time or another as suitable hedging material, though only a few received trials on a significant scale. Native American thorns were extensively advocated and found large-scale use in a few localities.[90] Wild roses, particularly the Cherokee rose, were popular in the South,[91] and other plants

[82] For example, in Kansas and Tennessee. A traveler wrote: "I claim that the *stone* in Kansas adds millions to her value over any prairie country I have ever seen. So far as I have been, there is an abundance for fencing and building purposes, thus supplying the scarcity of timber. . . .Enough for timber and stone can be found on or near every claim for fencing and building purposes."—*Rural New Yorker*, 10:238 (1859).

[83] *Valley Farmer*, 9:42 (1857); *Tennessee Farmer and Mechanic*, 2:8 (1857).

[84] For example, in Onondaga and Tioga counties, New York, and Cumberland County, Maine. See *American Agriculturist*, 18:13 (1859); *Connecticut Valley Farmer and Mechanic*, 2:97 (1854); *Maine Farmer*, Feb. 3, 1859; *Plough, Loom and Anvil*, 8:665–666 (1855); New York State Agricultural Society, *Transactions*, 1859, p. 300; Barrett, *Out West*, 117.

[85] Considerable ditching and sodding for fences was reported from Fremont County, Iowa. See *Northwestern Review*, 1(8):5 (1858). Success was claimed for this form of fencing in Otsego, Wisconsin, at a cost of 50 cents per rod. Efforts by English settlers to build such fences near Stafford, New York, about 1825 were failures. See *Rural New Yorker*, 10:158 (1859). Cf. *American Agriculturist*, 9:156 (1851); *Ohio Cultivator*, 8:258–259 (1852); Michigan State Agricultural Society, *Transactions*, 1851, p. 249; 1860, p. 110.

[86] *Working Farmer*, 11:39 (1859); *American Cotton Planter*, 13:356 (1859); *Northern Farmer*, 2:370 (1857), 3:367–368 (1858); *Prairie Farmer*, 10:333 (1850), 13:103–104 (1853).

[87] *American Agriculturist*, 18:46 (1859); Bordley, *Essays and Notes on Husbandry*, 201.

[88] U. S. Agricultural Society, *Journal*, 2:163 (1855); A. J. Downing, *Rural Essays*, 360 (1854); *Prairie Farmer*, 11:211 (1851).

[89] *Valley Farmer*, 8:344 (1856).

[90] A center of such experimentation was the progressive county of New Castle in Delaware. It was among the leading areas of the country in the adoption of the reaper and the seed drill and experimented extensively with the thorn hedge in the late forties and early fifties. Early in the decade it was claimed that the county had more land fenced with hedges than any other in the United States. The New Castle Thorn which was used eventually proved to be unsuccessful. It was found useless against hogs, required too much land, died out consistently, and was attacked by a borer with destructive results. See *American Agriculturist*, 9:298 (1851); *Cultivator*, 7:67 (1850); and Robinson, *Facts for Farmers*, 872. The New Castle Thorn was also used in eastern Pennsylvania. See *American Farmer*, 7:137–138, 148 (1851); *Cultivator* (n.s.), 9:50 (1852); Downing, *Rural Essays*, 360–361.

[91] A correspondent of the *American Cotton Planter* (n.s.), 3:31 (1859), claimed that thousands of miles of hedge of Cherokee rose existed in South Carolina, Georgia, Mississippi, and Texas. Cf. *Farmer's and Planter's Monthly*, 10:60–61 (1859); *Plow*, 1:324 (1852); *Southern Cultivator*, 13:301 (1856); *Southern Planter*, 10:166 (1850); 11:370 (1851); 17:344, 362–363 (1857); 18:185–188, 344, 362–363 (1858); 29:150–154 (1859); *Soil of the South*, 3:498 (1853); Robinson, *Facts for Farmers*, 872.

received local trials.[92] It was to the Osage-orange, however, that by far the largest amount of attention was devoted, particularly though not only in the West. Upon this plant was centered much of the hope of a solution to the fence question by means of hedging. The advocates of this plant claimed that, properly trimmed and cultivated when young, an animal-proof hedge could be produced that would be permanent, that costs for maintenance and replacement were negligible, and that it could be established at a cost lower than required for a post-and-board fence. The Osage-orange was considered by many to be the answer to the increasing scarcity of timber in the older States.[93] Some held that the future availability of the prairies for agriculture was dependent upon the successful culture of this plant;[94] indeed, it was hailed as the "God-given" fencing material for the prairies.[95]

The Osage-orange first received serious attention as hedging material about 1830. It was still largely untried when the plant began to be called to the public attention in the late forties.[96] The plant is a native of South Central United States and as such its resistance to midwestern winters was a question and a subject of skepticism. Its ability to make an unpenetrable fence was uncertain, its cultural requirements were not widely understood, and its economy was unknown. Assertions that the Osage-orange would meet all that could be required of it were frequent in the agricultural journals of the fifties, as were also reports on experiments with the plant and articles describing the technique of making a hedge.[97] The Osage-orange hedge received the endorsement of several agricultural societies,[98] and likewise

[92] Thirty or more plants found advocates as fencing material including besides those mentioned arbor vitae, hemlock, wild peach, gooseberry, honey locust, red adler, beech, wild birch and white pine. See *American Agriculturist*, 9:289 (1851); *Country Gentleman*, 1:291, 324 (1853); *Farmer's Companion and Horticultural Gazette*, 3:121 (1853); *Homestead*, 2:477, 526 (1856); *Horticulturist*, 6:82–83, 483 (1851); *Northwestern Farmer*, 1:224 (1856); *Working Farmer*, 1:37 (1849); 4:67 (1852); New York State Agricultural Society, *Transactions*, 1858, p. 501–507; U. S. Patent Office, *Report on Agriculture*, 1851, p. 445–446.

Interest in hedging plants other than the Osage-orange and the Cherokee rose centered largely in New England and New York. See *Boston Cultivator*, Jan. 5, 1850, Apr. 13, 1850, May 17, 1851, and Mar. 1, 1855; *Cultivator*, 7:67 (1850); 9:335 (1852); *Maine Farmer*, Oct. 11, 1849, Feb. 19, 1852; *New England Farmer*, 4:108–109, 206 (1852); 5:206 (1853); 7:512 (1855); *Rural New Yorker*, 7:134 (1856).

[93] "As timber becomes scarce, in the older States, necessity will compel us to substitute live hedges for the unsightly and very expensive zig-zag rail fences which everywhere disfigure the landscape."—*Southern Cultivator*, 16:89 (1859).

[94] "It would be a great blessing to the inhabitants of the vast prairies of this region of country, if the Osage-orange could be made to replace the *pieux* or rail fence, which is becoming the case; if such become the case, the one great objection that exists with a great many persons to settling in our prairies, the lands of which are fertile and peculiarly adapted to stock farming, would be removed."—*American Cotton Planter*, 13:369–370 (1859). Cf. *Iowa Farmer*, 2:22 (1854). An essay on hedging awarded a prize by the Ohio State Board of Agriculture declared: "We must grow our fences out of the soil upon which they are to stand, and which cannot be otherwise used."—*Ohio Cultivator*, 11:85–87 (1855).

[95] *Valley Farmer*, 5:314 (1853), citing the Dayton (Ohio) *Journal*.

[96] According to David Landreth, an early promoter of the Osage-orange, the plant was introduced to the East as a result of the Lewis and Clark Expedition. Landreth claimed further for his father the honor of planting the first Osage-orange hedge in Philadelphia (and in the East) about 1828. See *Southern Cultivator*, 13:161 (1856), citing the Germantown *Telegraph*; Warder, *Hedges and Evergreens*, 193 (1858).

J. B. Turner of Cincinnati was probably the most aggressive advocate of the Osage-orange and one of its chief publicists. He began his experiments with the plant about 1830–35. See *Cincinnatus*, 3:167–171 (1858); *Indiana Farmer*, 1:258 (1851); *Prairie Farmer*, 12:112–113 (1852); *Rural New Yorker*, 6:93 (1855). Henry Ellsworth endorsed the Osage-orange for hedging use as early as 1838. See *Valley of the Upper Wabash, Indiana, with Hints on its Agricultural Advantages*, 51–52 (1838).

On the early history of the Osage-orange hedging, see *Prairie Farmer*, 15:169–171, 268–270, 272. On the role of the *Prairie Farmer* and its editor, John S. Wright, in this movement, see Lloyd Lewis, *John S. Wright, Prophet of the Prairie*, 152–162 (Chicago, 1941).

[97] Caldwell, *Treatise on Hedging*, 65–138; Downing, *Rural Essays*, 365–373; S. E. Todd, *Young Farmer's Manual*, 196–226; *Northwestern Farmer*, 1:36–37 (1856); *Western Farm Journal*, 2:36, 48 (1856).

[98] See the resolution in the Ohio State Board of Agriculture, *Report*, 1854, p. 25: "We recommend to the farmers of Ohio, the Osage Orange as a most valuable plant for hedging, superior in every respect to any other plant which has yet been introduced in Ohio for economical and enduring fences." The committee on farms of the Illinois State Agricultural Society likewise endorsed

received legislative approval as a legal fence.[99] Seed and plants were widely advertised. Companies which undertook to plant and care for hedges on contract made their appearance, offering their services at from 50 to 60 cents per rod of hedge, or $100 a mile, a cost of fencing far below that of any other form.[100] The Illinois Central Railroad contracted with one of these firms for the hedging of its right-of-way from Chicago to Cairo in 1854, 20 miles of which were planted within the year.[101] The plant was utilized by land speculators to increase the marketability of their lands.[102] It was claimed that the opportunity to make fences with hedges increased the rate at which prairie lands were entered with the Government.[103] Nine thousand miles of Osage-orange hedge were reputed to have been set in the spring of 1855.[104] The plant found some use in the South and East,[105] but in the West, as in Ohio, Illinois, and Indiana, it was used on a large scale.[106] The Iowa State Census of 1862 reported 306,728 rods of hedging in the State, a comparatively small quantity but

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the plant although a later committee on hedging found that there were quite as many failures with hedging as successes. See *Indiana Farmer*, 7:171–172 (1858); Illinois State Agricultural Society, *Transactions*, 1856, p. 153.

[99] This was done in Indiana and Illinois. See *Farm and Shop*, 1:25 (1853); *Prairie Farmer*, 11:457 (1851).

[100] These companies apparently carried on considerable business for a time. Largest among these firms was J. Sumpter & Co. (at one time known as McGrew, Leas & Co.) of Dayton, Ohio, which operated an Osage-orange nursery at Kankakee, Illinois. This firm had contracts in 1854 to plant 100 miles of Osage-orange hedge in Ohio. The company operated in the East through subcontractors. It advertised: "Hedges set and warranted at from 33 to 40 cents per rod, with a fair deduction where large contracts are made. Hedges completely grown at from 75 cents to $1 per rod—the payment as follows: one-third when the hedge is set and the balance when it will answer the purpose of a good fence. Hedges grown for what disinterested judges will say it is worth (as compared with wood fences) when it is completed. Hedges completely grown at $1 to $1.25 per rod to be paid for when completed."—*Ohio Cultivator*, 10:79 (1854). See also *American Farmer*, 11:159 (1854); *Ohio Cultivator*, 9:275 (1853); 10:79, 104 (1854); *Valley Farmer*, 6:130–131, 303 (1854). W. A. Allender & Co., the largest firm in northern Illinois, set 1,200 miles of hedge in 1856; James Griffin set 150 miles in three northern Illinois counties. Allison & Coulter were reported as having planted 40 miles of hedge in four Iowa counties. Overman and Man of Bloomington, Illinois, grew 600 miles of hedge plants in one season. An Iowa firm, J. W. Liggett, advertised that it would hedge wild lands, taking a part in payment. A southern operator advertised that he would plant hedges of Cherokee rose and tend it for three years for $100 a mile. Other firms included C. Robb & Co. of New Richmond, Indiana; Daniel Drake of Trenton, Ohio; K. Graves of Warren County, Ohio; and Long Sleeper of Bridgeton, Missouri. See *American Agriculturist*, 14:137 (1855); *American Cotton Planter* (n.s.), 3:31 (1859); 11:178 (1857); *Illinois Farmer*, 5:50 (1860); *Indiana Farmer*, 1:99 (1851); *Iowa Farmer*, 4:159 (1856); *Prairie Farmer*, 14:93 (1854); *Ohio Cultivator*, 10:79 (1854); *Ohio Valley Farmer*, 2:182 (1857); *Valley Farmer*, 7:111, 116 (1855); 8:212 (1856); *Tennessee Farmer and Mechanic*, 1:426 (1856); Gerhard, *Illinois As It Is*, 355–362.

[101] This contract was with J. Sumpter & Co. See *American Agriculturist*, 15:74 (1856); *Iowa Farmer*, 1:252 (1853); *Ohio Cultivator*, 11:53 (1855); *Prairie Farmer*, 14:363 (1854); *Rural New Yorker*, 6:110, 224 (1855); *Scientific American*, 9:254 (1853–54).

[102] "Hundreds and thousands of acres of the western prairies have been enclosed with Osage Orange, held by their owners as a matter of speculation, solely to add to the value of the land when sold. We have seen miles of the hedges planted that will be a total failure."—*Rural New Yorker*, 9:93 (1858), cited in *The Fence*, no. 14.

[103] "Thousands of acres of prairie land, lying in this county, distant from timber, have recently been entered at the Land Office, and to my knowledge, with the Osage Orange in view—entries that would not have been made for years, only for the prospect of this speedy, cheap and lasting protection." The reference is to Paris, Illinois. See *Prairie Farmer*, 12:523 (1852). Cf. *Rural New Yorker*, 6:110 (1855).

[104] *Rural American*, 1:181 (1856).

[105] On its use in the East, see: *Boston Cultivator*, Nov. 9, 1850; *Homestead*, 1:772 (1855); *New England Farmer*, 7:512 (1855); *Pennsylvania Farm Journal*, 1:71, 74 (1851); 4:54 (1854). On its use in the South, see: *American Cotton Planter* (n.s.), 2:241, 273 (1858); 3:149 (1859); *American Farmer*, 8:216, 270, 331 (1852); *Southern Cultivator*, 11:149, 216–217 (1854); *Southern Planter*, 11:370 (1851); *Tennessee Farmer and Mechanic*, 1:46 (1856).

[106] *Boston Cultivator*, Mar. 30, 1850; *Cultivator* (n.s.), 9:315 (1852); *Illinois Farmer*, 3:138 (1858); *Indiana Farmer*, 2:34, 102, 306 (1852); *Ohio Cultivator*, 5:285–286 (1849); 6:27 (1850); 7:363 (1851); 9:139 (1853); *Prairie Farmer*, 12:388, 423 (1852); *Rural American*, 1:130 (1856); *Rural New Yorker*, 6:110, 354 (1855); *Southern Cultivator*, 13:131 (1856); *Valley Farmer*, 6:140 (1854); *Wisconsin and Iowa Farmer and Northwest Cultivator*, 3:197 (1853); 4:195 (1853); 7:161 (1855).

indicative nevertheless of the interest in the plant.[107]

The merits of the Osage-orange were the subject of constant debate from the time of its introduction. After 1855, however, the enthusiastic tone of the agricultural press regarding the plant began to be displaced with increasing skepticism. The winters of 1855–56 and 1856–57 did extensive damage to the Osage-orange hedges in Ohio and northern Illinois and confirmed the suspicions of those who had questioned the plant's hardiness.[108] In reporting on badly winter-injured hedges, the editor of the *American Agriculturist* wrote that he had not enough faith in them to undertake the expense of planting 500 rods.[109] Moreover, hedges were not meeting public expectations, aside from the question of hardiness. Four or five years after planting, a hedge that had been improperly cared for proved to be perfectly useless as a fence, and there were apparently very many such.[110] Accounts of failures appeared more frequently, and among these, the abandonment by the contractor in 1856 of the hedge fence of the Illinois Central Railroad and the announcement that the project was a complete failure was especially significant.[111]

Those who continued as proponents of hedging laid the responsibility for the disappointments, including the experience of the Illinois Central, to bad management. The contract growers, in particular, were accused of slovenly work[112] and were attacked for the discredit thrown on hedging. Failures could more accurately be ascribed to the inability or unwillingness of farmers to meet the high labor requirements of proper hedge cultivation. Even in the areas where the Osage-orange was perfectly hardy, the hedge required careful plantng, frequent cultivation, intelligent trimming, and protection from prairie fires. Indeed, protection from stock was best achieved by building a wooden fence to protect the young hedge.[113] These requirements had been recognized from the beginning by a few and had in fact been emphasized by those most convinced of the usefulness of the plant. The realization of these requirements by the public terminated the Osage-orange mania. The advantages the plant offered as a hedge seemed nullified by its cultural requirements which seemed impossible to supply and made its economy doubtful, particularly in view of its need for protection during its early years.[114] The per-

[107] Iowa State Census, 1862, p. 8. Also cited in W. G. Wilson, *Description of Iowa and Its Resources*, 88–89 (1865).

[108] A special committee was appointed by the Cincinnati Horticultural Society to examine the damage. Though the committee found considerable damage, it expressed continued confidence in the plant. See *Ohio Cultivator*, 12:196, 214 (1856); *Cincinnatus*, 1:348–349 (1856); *Northwestern Farmer*, 1:283 (1856); *Rural American*, 1:211 (1856); *Rural New Yorker*, 7:109 (1856); *Scientific American*, 12:387 (1856–57); *Wisconsin Farmer*, 8:8 (1856); *American Agriculturist*, 18:46 (1859); *Iowa Farmer*, 5:121 (1857).

[109] *American Agriculturist*, 16:185 (1857). "I have come to the conclusion that the Osage Orange will answer for a hedge, so long as you have a good rail fence on one side and a board fence on the other."—*Iowa Farmer*, 5:121 (1857).

[110] "We have seen miles of this hedge planted that will be a total failure. Indeed, perhaps, not one rod in a hundred of the many thousands that we saw at the West will ever make a hedge worth having. Some are planted and neglected ever thereafter. Others are cultivated and pruned for the first year or two and then left to take their course. Others are tolerably well cultivated and never pruned thoroughly."—*Rural New Yorker*, 9:93 (1858).

[111] *American Agriculturist*, 16:185, 255 (1857). For reports of failures, see *ibid.*, 4; *American Cotton Planter* (n.s.), 1:232, 328 (1857); *Iowa Farmer*, 5:121 (1857); *Northwestern Farmer*, 1:283 (1856); *Rural New Yorker*, 10:350 (1859); *Valley Farmer*, 8:83–85, 106–108, 313, 375 (1856); *Wisconsin and Iowa Farmer and Northwest Cultivator*, 2:274 (1852).

[112] "We are told that nine-tenths of all the western hedges have failed from this very cause."—*Iowa Farmer*, 4:358 (1856). Cf. *American Agriculturist*, 16:185 (1857); *Southern Planter*, 18:362–363 (1857); 18:344 (1858); *Valley Farmer*, 8:311 (1856); 9:81–83, 111–112 (1857).

[113] *American Agriculturist*, 16:255 (1857); 18:78 (1859); *Prairie Farmer*, 14:78 (1854); Parker, *Iowa Handbook for 1856*, p. 160.

[114] "Not one man in twenty will ever bestow the necessary attention to it to obtain success."—*Valley Farmer*, 12:325 (1858). "Hedge planting in America has been a series of failures; . . . from the injurious planting and treatment; planting too close, too near to a dead fence, want of cultivation, and sufficient pruning."—*Pennsylvania Farm Journal*, 5:109 (1855). "Again do not flatter yourself that the mere planting of a hedge is all the labor and care it will need forever; for the hedge must itself be protected by a fence for many years, and it must have attention too, and be nursed with fostering care. . . ."—*Michigan Farmer*, 9:60 (1851). The *Western Agriculturist*, 2:257, 266 (1853), commented editorially: "We have long believed that the Osage Orange for hedging was one of the money making hum-

manent character of hedge fencing did not fit into the psychology of the West while the long period of growth it required made it of little value to the farm-maker who required fencing immediately.[115] The Osage-orange continued to have numerous advocates for the next several decades and continued to be planted but it lost most of its popular appeal as the solution of the fencing problem.

There were many who, dissatisfied at the prospects of success with the Osage-orange, found hope for the solution of the problem in the use of wire. Wire fencing was not an innovation of the fifties. Fencing with iron wire had been introduced into Pennsylvania at least as early as 1810.[116] Iron wire was expensive, however, and interest in the subject proved short-lived.[117] Wire fencing returned to public attention in the late forties,[118] accompanied by much debate in the agricultural journals and nation-wide experimentation. Claims of successful use of wire were numerous and came from virtually all parts of the Nation.[119]

These fences were made of common commercial iron wire. From four to eight wires were used, the cost of the fence varying correspondingly from 50 cents to $1.50 per rod.[120] It was claimed that if made of wire of the proper strength, properly set up and adjusted to temperature changes, such fences would give satisfactory and economical service and that they "would turn anything but a hog and even that if of any respectable breed."[121] Advocates of wire fencing ascribed failures to poor construction.[122]

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bugs of speculators, by which the public are occasionally made to pay dearly for a little practical experience. That such has been the case in this region no one will pretend to deny." Cf. *American Cotton Planter* (n.s.), 2:144, 227 (1858); *Wisconsin and Iowa Farmer and Northwest Cultivator*, 3:197 (1853).

[115] *Prairie Farmer*, 12:195 (1852); *Rural New Yorker*, 10:397 (1859).

[116] It was argued before the Philadelphia Society for Promoting Agriculture in 1816 that wire fences with posts of living trees was the cheapest form, considered over a 50-year period. See *Memoirs*, January 1816, p. 3–8. Cf. *Pennsylvania Farm Journal*, 2:23 (1852); *The Fence*, no. 13.

[117] About 1830 there was a revival of interest which was also short lived. See *Valley Farmer*, 12:167 (1860).

[118] The *Rural New Yorker*, 1:9 (1850), for example, commented that the subject had been considerably agitated for a year or two and asked its subscribers for notes on their experiences with wire fence. See also *Cultivator* (n.s.), 7:144 (1850); *Rural New Yorker*, 2:25 (1851); *Southern Planter*, 9:170–171 (1849).

[119] A successful wire fence paralleling the right of way of the Baltimore and Washington Railroad at Laurel Factory attracted widespread interest and comment. See *American Agriculturist*, 10:91 (1852); *Genesee Farmer*, 16:195 (1855); *Valley Farmer*, 12:167 (1860); *Wool Grower and Stock Register*, 2:28 (1850).

For reports on the experiments with wire fencing in the East (Connecticut, Maine, Massachusetts, New Hampshire, New York, and Pennsylvania), see *American Agriculturist*, 9:96 (1851); *Boston Cultivator*, July 26, 1851; *Country Gentleman*, 5:297, 338 (1855); 6:105 (1855); *Cultivator* (n.s.), 6:254 (1849); 7:144, 278–279 (1850); 8:82 (1851); *Homestead*, 1:454, 485, 665 (1856); *Maine Farmer*, Jan. 17, Feb. 28, Mar. 14, Apr. 18, 1850, Sept. 15, 1853, Sept. 4, 1856; *New England Farmer*, 10:427 (1860); *Pennsylvania Farm Journal*, 1:117 (1851); *Rural New Yorker*, 1:49 (1850); 3:89 (1852); 4:49, 56, 65 (1853); 7:133–134, 158 (1856); *Scientific American*, 10:130 (1854–55); *Wool Grower*, 2:45, 71 (1850); Massachusetts Board of Agriculture, *Annual Report*, 1850, p. 432; 1857, p. 208–209; New York State Agricultural Society, *Transactions*, 1850, p. 328, 519.

For reports on wire fences in the West (Illinois, Iowa, Michigan, and Wisconsin), see *American Agriculturist*, 9:62 (1851); 19:71 (1860); *Country Gentleman*, 3:119, 181 (1854); *Genesee Farmer*, 12:210 (1851); *Iowa Farmer*, 4:57 (1856); 5:102 (1857); *Illinois Farmer*, 39 (1855); *Maine Farmer*, May 4, 1854; *Michigan Farmer*, 14:112 (1856); 16:97–98 (1857); *Plough, Loom and Anvil*, 5:155–156 (1853); *Prairie Farmer*, 12:186 (1852); *Rural New Yorker*, 7:158 (1856); *Scientific American* (n.s.), 3:285 (1861); *Southern Planter*, 18:87 (1858); *Valley Farmer*, 2:118–119 (1850); 11:142–143 (1859); *Wisconsin and Iowa Farmer and Northwest Cultivator*, 2:108–109 (1850); *Wisconsin Farmer and Northwest Cultivator*, 8:388 (1860); American Institute, *Transactions*, 1852, p. 348; Illinois State Agricultural Society, *Transactions*, 1856–57, p. 425–432.

There was apparently little interest in the South. *American Agriculturist*, 9:219 (1851); *Cultivator*, 9:287 (1852); *Plow*, 1:150 (1852).

[120] "There does not seem to be any settled rule yet for making it, either as to number of posts or size of wire, nor is the wire furnished at so cheap a rate as it will be when the demand becomes greater and more steady. It is pretty well settled that Nos. 9, 10 and 11 are the best sizes. Perhaps for top and bottom No. 9 and intermediate either 10 or 11 would do as well. When a bottomboard is not used, if designed to turn swine, at least 8 strands seem to be required, but for cattle or sheep six would be sufficient and even less."—*Wool Grower and Stock Register*, 2:28 (1850). Cf. *Boston Cultivator*, July 26, 1851; *Cultivator*, 6:254 (1849); *Valley Farmer*, 2:118–119 (1850).

[121] *Genesee Farmer*, 16:115 (1855). S. Edwards Todd, in a treatise on fencing in New York State Agricultural Society, *Transactions*, 1858, p. 443, declared: "Fences

Despite the claims made for it, fencing with plain wire was not of sufficiently general success to command wide acceptance.[123] Plain wire fences were intended to enclose livestock by sheer strength; there was apparently no idea that animals could be made to avoid the wire. To secure maximum strength it was necessary to keep the wires constantly taut. This presented serious problems and was the greatest source of difficulty with these fences, as constant breakage occurred in the taut wires as a result of contraction and expansion following changes in temperature.[124] The wire available was not commonly galvanized which required the added task of painting the wire.

The obvious defects of the common wire fence stimulated much experimentation, and a number of patents were issued during the decade.[125] Most of these dealt with the problem of securing elasticity of the wire, but of greatest significance was the patent issued in 1854 for a machine to make woven-wire fencing.[126] Woven-wire fencing appeared on the markets about 1855 in a wide variety of weights, the product of a number of Eastern manufacturers.[127] Such fences apparently found only a very limited acceptance in the fifties, and were not to be perfected for another forty years. Fundamentally the skeptical attitude toward wire fencing of both forms was justified by the inadequacy of the iron wire available. Its introduction at this time is nevertheless indicative of the vigor of the attack on the fence problem.

No part of the United States escaped the neces-

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of wire are no longer viewed as an object of doubtful utility by men of enterprise and of practical common sense in building fences of any kind." Cf. *American Agriculturist*, 19:71 (1860); *Iowa Farmer*, 4:185 (1856); *Valley Farmer*, 10:364 (1858); Illinois State Agricultural Society, *Transactions*, 1856–57, p. 425–32.

[122] "We are aware that this kind of fence has been brought into disrepute by using a poor, cheap made kind, but it strikes us, that any one using the right kind, will find it durable and as cheap as any other kind of fencing material here in the West."—*Iowa Farmer*, 4:185 (1856). Cf. *Cultivator*, 7:84 (1850); *Rural New Yorker*, 2:25, 33, 40, 48, 57 (1851).

[123] For example, J. J. Mapes, influential agricultural writer, strongly advocated wire fencing as editor of the *Working Farmer*, 1:110, 130, 171 (1849); 2:180, 199, 239 (1850). Later he decided that wire fences were impracticable and said that "Wire fences are not generally approved as far as our observation extends." See *Connecticut Valley Farmer and Mechanic*, 1:59 (1853); *Working Farmer*, 6:149 (1854); *American Agriculturist*, 8:327 (1856). Others noted that although the public attention had long and frequently been called to them, they did not appear to grow in favor. See *Farmer's Companion and Horticultural Gazette*, 3:190 (1853). Wire fences tried in Oneida County, New York, along the Hudson River and in Connecticut were declared unsuccessful on account of the poor quality of the iron. See *Connecticut Valley Farmer and Mechanic*, 2:97 (1854); *Rural American*, 1:225 (1856). Cf. *Genesee Farmer*, 12:210 (1851); *New England Farmer*, 12:302 (1860); *Rural New Yorker*, 1:82 (1850).

[124] Experiments with wire fencing in California were reported a failure, it being declared that they lasted not over a year and had to be mended by inserting strips of rawhide to give the wires elasticity. See *Genesee Farmer*, 16:110–111, 195 (1855); *American Agriculturist*, 18:327 (1859); *Connecticut Valley Farmer and Mechanic*, 1:59 (1853); *Cultivator*, 7:47 (1850); *Plough, Loom and Anvil*, 6:32–34 (1852); New York State Agricultural Society, *Transactions*, 1858, p. 443–444; *Working Farmer*, 6:149 (1854).

[125] Eighty-five patents relating to fences were granted during 1850–59. Seven were devices to maintain elasticity of wire fences; three were wire-fastened picket fences; the majority dealt with portable fences.

[126] Patent 10743, Apr. 4, 1854 granted to John Nesmith of Lowell, Mass. "The invention consists in certain devices for revolving the wires at the same time that they are being twisted." The *New England Farmer*, 12:80–82 (1855), commented on this patent: "The agricultural mind of the country has long been conscious that a total revolution must, sooner or later, supervene in our modes of fencing. Iron fencing has been suggested and doubtless, would have come into general use, but for a want of a method of making it by machinery."

[127] The Lowell Wire Fence Company of Lowell, Mass., beginning in 1855, conducted a nation-wide advertising campaign. Identical articles and advertisements appeared in virtually every agricultural journal published in the United States describing the styles and prices of the woven-wire fence produced by this firm. See, for example, *Maine Farmer*, Apr. 26, 1855; *Plough, Loom and Anvil*, 7:417 (1855); *Rural New Yorker*, 7:205 (1856); *Southern Cultivator*, 16:142, 176–177 (1858). Other manufacturers of woven-wire fencing included E. Whitman & Co. of Baltimore. See *American Farmer* (n.s.) unpaged advertising section in vol. 14; *Rural Register*, 1:341 (1860). James E. Butts Co. and Z. Homer & Co. of Boston. See *Illinois Farmer*, 5:95 (1860); *Maine Farmer*, July 17, August 7, 1856; *Valley Farmer*, 2:251 (1851). The New York Wire Railing Co. offered a particularly varied line of iron and wire fences. See the firm's catalog: *A New Phase in the Iron Manufacture* (New York, 1857); also *Southern Cultivator*, 14:48–49 (1856).

sity of dealing with the fencing problem. The question of what to use for fencing was universal, in old sections as well as new, in sparsely settled as well as densely settled areas, in cotton, grain, and grazing regions. The problem attracted the thought and excited the inventive ingenuity of thousands; indeed, the interest is a testimonial to the mental aggressiveness of the American farmer in this period. He sought an adequate and lasting fence that could be made with cheap materials and would have low labor requirements. Wire suggested a solution, but the metal available was unsuitable for the purpose, and as long as iron, rather than steel, wire was used the skeptical attitude encountered was justified. That difficulty was to be solved for agriculture by the metallurgist. With the introduction of the Bessemer process of steel production, a metal was made available that was cheap and strong, that made possible woven-wire fence of adequate strength and quality, and that also made possible the successful application of the barb and the twisted dual wire to supply the cheap, efficient, barbed-wire fence. More than any other one thing or event, it was cheap steel that supplied the answer to the fence problem. Its solution was the result of no stroke of genius nor even the consequence of local or regional experimentation. Many minds and many experiments in widely separated areas and the assistance of technological change outside of agriculture contributed to the final settlement of the problem.

NEWS NOTES AND COMMENTS

DECEMBER 1944 MEETING

The Agricultural History Society will meet with the American Historical Association and other historical societies at the Stevens Hotel in Chicago on December 28, 1944. The Society's joint session is to consist of a symposium on "The Land in Critical Periods" with Russell H. Anderson of the Museum of Science and Industry presiding. The speakers and papers are: Frank L. Owsley, Vanderbilt University, "The Pattern of Migration and Settlement in the Old South"; Rudolf Freund, University of Virginia, "The Ex-Soldier and the Land Question: Some Historical Remarks"; and Donald C. Horton and E. Fenton Shepard, U. S. Bureau of Agricultural Economics, "Federal Aid to Agriculture since World War I." This program was arranged by Joseph C. Robert of Duke University.

HERBERT A. SMITH, 1866–1944

Dr. Herbert A. Smith, a member of the editorial board of *Agricultural History*, died at South Salem, New York, on July 21, 1944. He was a graduate of Yale University and had studied at the Sorbonne. He taught English at Yale from 1891 to 1898 and then did editorial writing for the *New York Evening Post* and *World's Work* until 1901 when he joined the U. S. Forest Service. He served as its editor until 1920, as assistant forester in charge of branch public relations from 1920 to 1926, on special assignments from 1926 to 1934, and then as collaborator. He was editor-in-chief of the *Journal of Forestry* during 1935–37. Dr. Smith was much interested in promoting the collection of records relating to forest history and in research and writing in this field. For details, see *Who's Who in America*, 1944-45; and the *Washington Post* (D. C.), July 25, 1944.

OBJECTIVES FOR THE AGRICULTURAL HISTORY SOCIETY DURING ITS SECOND TWENTY-FIVE YEARS

EVERETT E. EDWARDS

This prospectus was prepared at the instance of the Society's president, James C. Malin, and submitted at the twenty-fifth anniversary meeting on February 14, 1944. In letters dated December 18, 1943, President Malin invited the members of the executive committee to submit suggestions for incorporation. At the meeting on February 14, a motion by Dr. Solon J. Buck suggesting the publication of the prospectus in *Agricultural History* and of comments thereon in succeeding numbers was adopted. In accordance with this resolution, all readers of the prospectus here printed are urged to forward their comments to the editor of *Agricultural History*.

Twenty-five years ago, the Agricultural History Society was founded to stimulate interest in, to promote the study of, and to facilitate research and publication on the history of agriculture. This trilogy of objectives as epitomized in the Society's Constitution was—and still remains—a large order, and by virtue of their scope, it is difficult to evaluate the extent of their fulfillment. In addition, the Society's interpretation of its role in relation to related fields of knowledge has resulted in streams of influence that can not be measured readily. Among other things, it has sought to demonstrate the importance of the historical approach in comprehending agricultural problems and likewise the importance of the history of agriculture as a part of history in its entirety. Recognizing that agricultural history includes many forces that are the special concern of other histories, the Society has also consciously sought to promote its field as a contribution to a better understanding of history in general rather than to set it apart as a separate and distinct discipline. The Society may have fallen short of fulfilling all the hopes of certain of its founders, but the mere fact that it has lived to celebrate its twenty-fifth anniversary may be considered at least partial evidence of a useful existence.

As to the future, there seems to be no need of amending or abrogating these objectives, which have met the tests of time. The Society does have, however, the potentialities of expanding its activities appreciably and becoming an international center in its particular field.

In addition, the nature of the present world crisis gives a greater emphasis to the obligations of the social sciences than was apparent twenty-five years ago. The United States is irrevocably committed to continuing as a democracy, and, this being true, it behooves all who work in these fields to provide the media by which democracy—political, social, and economic—can continue to meet its destiny. Only recently has the leadership in the social systems begun to consider the evolvement of techniques that facilitate the exploration and fruition of the native potentialities of all the mentally and physically normal human beings. To date, the social systems have been content to liberate only the powers of the privileged, and the result has been a colossal waste of human capacities and energies. This social tyranny has been the primal active cause of the social maladjustments and unrests incident to the instabilities of the past. Lasting peace and justice can come into being only when every individual in every social group is enabled to contribute his maximum—socially, culturally, and economically—to the groups to which he belongs and when these groups in turn contribute their maximum to the individual. Intelligent orientation—international, national, and local—is essential to the achievement of this *summum bonum*. The leadership must have the data gleaned by the social scientists in usable form. The individual must be enabled to understand the values of his heritages. To understand them is to free him for the present and future and to guarantee the perpetuation of that which is good from the past.

Granted even the relative truth of these contentions,[1] a delineation of the possible activities

[1] This same viewpoint is developed with reference to a somewhat different objective in Everett E. Edwards, "Rural Communities and the American Pattern," American Historical Association, *Annual Report* (in press).

that may be pursued by the Agricultural History Society with reference to maximum achievement is justified. To this end, a review of subjects deserving of the Society's continued attention and an outline of ways and means of facilitating the dissemination of knowledge concerning them are here presented.

SUBJECTS FOR INVESTIGATION

As with other fields, the history of agriculture and rural life should be approached with breadth of vision—in the spirit of seeking to know how conditions of the past took their particular form, of appraising these conditions with reference to the generation immediately affected as well as the present generation, and of indicating the modifications best calculated to serve the needs of the present and future generations.

Agriculture should be considered not only as an industry but as a way of life. Furthermore, research on agricultural history should recognize the relation of the various phases of agriculture to each other, of domestic agriculture to that of the world as a whole, and of agriculture to all other aspects of civilization.

The following subjects in the field of agricultural history are worthy of the continuous attention of research workers, either as individuals or in cooperation with others. As here outlined, the subjects mainly concern the United States, but for the most part they also constitute a pattern for other countries and periods.

1. The physical setting (physiography, climate, and soils): its relation to agricultural development; its evolution (water supply, vegetation, and soil changes) due to the actions of man and the resulting problems.

2. Colonization and settlement of the agricultural regions: the frontiers, horizontal and vertical, in the process; the realities of the process; the cultural influences brought from the older regions and other countries; the adaptation of inherited and acquired practices to new environments and conditions; the evolution of new patterns of rural action; the contributions of the American Indians and the various foreign groups; rural population changes.

3. Land policies: colonial, Federal, and State policies pursued in the disposition of the public domain by periods, regions, and specific phases; the processes by which land passed to actual farmers—agricultural colonies, land companies, land grants, land speculation; the correlation of private exploitation with the public interest—conservation, erosion control, flood control, forestry and reforestation, grazing problems, irrigation and reclamation, recreational uses of land, regional planning, resettlement activities.

4. Agricultural development: by periods; by regions, States, and localities; by types of farming—collective, cooperative, corporation, dry, irrigation, large-scale, part-time, submarginal, etc.; and by commodities—corn, cotton, horticulture, livestock, rice, sugar, tobacco, wheat, etc.

5. Buildings and equipment: types; furnishings and installations; feeds and seeds; fences; implements and machinery—automobiles and trucks, cotton gins and pickers, cultivating equipment, dairy equipment, harvesting equipment, plows, seeding equipment, tractors; the mechanization of agriculture; rural electrification.

6. Farm management: general practices; rotation systems; soil erosion, exhaustion, and restoration; pests and their control; types of management—owner, manager, overseer.

7. Labor: family labor; indentured servitude; slavery; the hired man; transient labor; employment services; organization of farm labor.

8. Tenancy: origins, developments, and social and economic consequences; types of tenancy, including sharecropping; organization of tenants' unions.

9. Financing the farm and the rural community: banking loans, public and private; mortgages; taxation; insurance; income and expenditure; monetary legislation.

10. Marketing of agricultural products: periods; media; cooperatives; prices; domestic and foreign markets; the spread between what the farmer receives and the consumer pays; expedients for increasing the farmer's share; governmental action.

11. Leadership: the nature of leadership by periods and communities; the individuals—editors, writers, publicists, inventors, scientists, protest leaders, statesmen; the role of women; leadership recognition—halls of fame, the Master Farmer movement, etc.

12. Agencies promoting the improvement of agriculture and rural life: agricultural societies—local, State, regional, and national organizations; agricultural fairs and expositions; agricultural periodicals, the literature on agriculture, and the rural press; State boards and departments of

agriculture; the United States Department of Agriculture; other Federal agencies—the General Land Office, the Reclamation Service, the Patent Office and the social and economic implications of the patent system; agricultural education—the early efforts, the land-grant colleges, the farmers' institutes, the development of extension and demonstration services, the 4-H club movement, the Future Farmers of America, the New Farmers of America; rural education; the agricultural experiment stations; the agricultural sciences—agricultural chemistry, agricultural economics, agricultural engineering, agricultural geography, agricultural history, agricultural statistics, agronomy, entomology, forestry, genetics, meteorology, rural psychology, rural sociology.

13. The farmers and the political movements seeking to improve their welfare.

14. The farmer as a consumer: self-sufficiency; handicrafts; processing food for the home; the media of exchange with the outside world—the country store, the mail-order houses, consumer cooperatives; the shift of agricultural industries to urban centers.

15. The agricultural industries: canning; cotton textiles; the cottonseed oil industry; leather processing; lumbering; meat packing; milling; sugar refining; woolen manufacture; the farm chemurgic movement.

16. Farmers as social beings: social conditions and strivings—amusements, diversions, entertainments, sports; community life—crime, customs, folk songs, health, intoxicants, lodges, moral attitudes; patronage of the arts—architecture, drama, handicrafts, literature, music, paintings, sculpture; intellectual strivings—the Chautauqua movement, education, libraries, literary tastes, lyceums, magazines, newspapers, scientific interests; religious strivings; the media of communication with outside world—the R.F.D., the automobile, the radio.

17. Agriculture in the life of the Nation: economic contributions; ideological contributions; social contributions; the balance of agriculture and industry; the contrasting viewpoints of the rural and urban elements of the Nation; the impact of outside forces on agriculture—the effect of technological changes on rural life, and the effect of changing social and moral concepts on rural mores.

WAYS AND MEANS

Collecting the Sources: The historians of any subject or field of history are dependent on the remains and records of the past for evidence concerning the nature of that past. The systematic collection and correlation of these sources are essential if research workers are to utilize their abilities to a maximum. Furthermore, the same source may well be used for several subjects, and it is, therefore, highly desirable that it be available in an organized collection.

The Society can assume a positive role with reference to these sources. It can collect and organize them for research workers. It can assist in the collecting, and it can be a clearinghouse for information concerning them. The originals of the sources should be secured whenever possible. Otherwise the modern techniques of copying by microfilming and microprinting should be utilized. It is especially important that the materials gathered shall be arranged and made available for use.

The Sources: The following are among the sources needed by historians and other research workers in the field of agriculture, and they should, therefore, be the main objective of any research center which seeks to collect and organize them with reference to their maximum utilization.

1. Physical survivals of the farmer, his farmstead, and his community: (1) The clothing and personal accessories of the farmer, his family, and his labor. (2) The furniture, furnishings, and the utensils and equipment of the farmer's home. (3) The farm buildings and their equipment. (4) The implements and machines used in the fields. (5) The country school, church, store, etc. As it is impracticable to preserve some of these items, photographic records are desirable.

2. Manuscript or unprinted materials: (1) The records that originated with the individual farmer—diaries and account books, letters, and memoirs and reminiscences. (2) The records of the social and agricultural organizations and institutions to which the farmer belonged. (3) The records of the institutions and organizations which served the farmer—account books of country stores, mills, elevators, stockyards, tobacco warehouses, cotton gins, and similar businesses. (4) The records of the forces in the Nation that influenced the farmer, his farm, and his community. These forces include colonization and settlement, land policies and systems of landholding, labor, equip-

ment of all kinds, marketing and financing, political movements, and agencies that have disseminated knowledge of improved methods to agriculture and rural life. Among the records relating to these forces that are of special interest and value are the following: The business records of land companies, individual speculators, and the railroads which received land grants; the records relating to the development, manufacture, and distribution of implements and machinery; the records of marketing organizations; the records of the processing of products that have migrated from the farm to the mill, the packing house, and the factory; the records and catalogs of mail-order houses; and the records of political movements. (5) The records of agricultural leaders, agricultural societies and fairs, agricultural periodicals, State boards and departments of agriculture, the United States Department of Agriculture, and the agricultural schools, colleges, and experiment stations.

3. Printed materials: (1) All printed articles, books, pamphlets, periodicals, reports, and special publications relating to agriculture. (2) Travel literature. (3) Trade publications of nursery and seed businesses, machinery companies, etc. (4) Rural newspapers that served as community diaries; metropolitan newspapers with sections designed to appeal to and serve rural circulations.

4. Archives (governmental): As a center of research in agricultural history, the Society can not collect the archives of the branches of the local, State, and Federal governments that relate directly to agriculture, but it can correlate information relating thereto and become a clearinghouse for research workers who can use assistance in this respect. Emphasis should also be given to categories of particular importance for agricultural history. With reference to the earlier periods, for example, deeds, mortgages, wills, and inventories of estates are important evidences of actualities.[2]

Agricultural History in the Classroom: The Society should continue the promotion of agricultural history as an important element of the curriculum in colleges and universities. It should encourage the offering of courses in the history of agriculture and the emphasizing of agricultural history as a part of general history courses. A survey of the history and present status of agricultural history in the curriculums would provide an understanding of the needs and problems involved. The Society should assist in preparing the texts and other materials needed.

Research: Granted the financial means, the Society could promote research in many ways, including the following:

1. Research fellowships to enable competent applicants to devote one, two, or three years to research and writing on significant subjects.

2. Grants-in-aid to enable competent applicants to spend limited periods of from three to nine months in completing projects that give promise of fulfilling the objectives here set forth.

3. Grants to encourage special projects, such as State and county histories of agriculture, by individuals, institutions, agricultural societies, etc.

4. Encouragement of a program whereby professional men and women of the Department of Agriculture, the colleges, and the experiment stations who are qualified by virtue of ability and experience may prepare histories of their particular fields of endeavor.[3]

5. Annual awards for outstanding contributions to agricultural history.

Publication Needs: Research and writing are of no avail if there are no media for presenting the completed products to the public. Likewise, further research is assisted if the findings of other research workers are available.

The Society's quarterly journal, *Agricultural History*, now in its eighteenth year, should be continued and expanded as a medium for the publication of articles and documents pertaining to the history of agriculture in all its phases and as a clearinghouse for information of interest and value to workers in the field. Materials on the history of agriculture in all countries should be included, and also materials on institutions, organizations, and sciences which have been factors in agricultural development. Regardless of whether the article is based on research in primary sources or a synthesis, the basic test on its inclusion should be the extent to which it contributes a useful unit of knowledge to the literature of agricultural history.

The Society should also sponsor or otherwise assist in the publication of the following types of books:

[2] The legal documents containing agricultural information are mentioned in a letter by Carl R. Woodward, Kingston, R. I., Feb. 23, 1944, to Everett E. Edwards.

[3] This proposal is emphasized in a letter by Arthur G. Peterson, Washington, D. C., Jan. 13, 1944, to Everett E. Edwards.

1. A comprehensive bibliography of the history of agriculture with provision for annual supplements.

2. Reprints of significant works on agriculture that have been out of print for a long time. These reprintings should have introductions and other editorial comment to clarify the text and delineate their significance. Some of these works are of interest to the general reader, but others are mainly the concern of research workers. For the latter, microprinting or a similar process may be the best method of duplication. Sources like the agricultural periodicals and the reports of the boards of agriculture are in this category. Microprinting provides the means of effecting not only a complete collection of these and similar sources at a central research center but of democratizing them by making prints available at nominal cost to all agricultural colleges and other research agencies that are interested in agriculture.

3. A series of source books to include carefully selected and organized materials from the sources listed above (see p. 189–190). The objective is to make agriculture tell its own story and to provide significant documents in their proper perspective for general use.

4. A series of monographs covering the subjects delineated above (see p. 188–189).

5. A 15- to 20-volume history of American agriculture which emphasizes the developmental nature of the subject. This set should be worked out in terms of the frontier and regional stages of development of the country as a whole.

6. A dictionary of agricultural words and terms; a chronology of agricultural developments; an encyclopaedia on the history of agriculture; and historical atlases on agriculture.

7. Illustrated books and pamphlets for school children.

8. A comprehensive one-volume history of agriculture in the United States and comparable works for the other main agricultural countries.

Democratization: The Society can provide data for and also utilize the modern media of disseminating knowledge—the radio, movies, filmstrips, the agricultural and daily press, etc.

The Society can give leadership in providing interpretative reminders of significant events and achievements of the agricultural past in various ways. Among them are markers, memorials, and monuments at the birthplaces, homes, and places of work of outstanding agricultural leaders, inventors, editors, experimenters, etc. A first step would be a survey of events worthy of memorialization and of the events and achievements already commemorated. The data so gathered would enable the Society to outline a plan of action in this field for itself and to assist other organizations in doing likewise. The information could be depicted on pictorial maps and in pamphlets that would popularize as well as commemorate the achievements of the agricultural past. By interpreting the past, attractive markers make the current generation conscious of its heritage and honor a basic profession.[4]

Museums: The Agricultural History Society has long maintained an interest in museums as an essential means of telling the story of agriculture, not only for the average citizen but the learned specialist.[5] It has sought to promote the establishment of a national agricultural museum in the United States and of regional and local institutions with similar purposes. In spite of the lack of concrete results to date, it should adhere to its objectives in this field. Certainly it is in a position to supply integrating leadership to the scientific and learned societies and the governmental agencies concerned with agriculture that are similarly aware of the opportunities and possibilities of a great national agricultural museum.

Museums of agriculture should have two main aspects, the historical and the currently descriptive and scientific.[6] The historical aspect should have two distinct purposes—increasing appreciation of the past by showing how previous generations lived, and pointing to the solution of current problems by considering past failures and successes.

[4] A survey of the sites of major events in the history of American agriculture is suggested in a letter by Joseph C. Robert, Durham, N. C., Jan. 4, 1944, to Everett E. Edwards.

[5] The Society has long had a standing committee on museums. Its present membership is: Carleton R. Ball (chairman), Russell H. Anderson, C. A. Browne, Allen Eaton, Everett E. Edwards, Herbert A. Kellar, Frederick L. Lewton, Louis C. Nolan, Arthur G. Peterson, O. C. Stine, M. L. Wilson, and Carl R. Woodward.

[6] This broad interpretation of the role of agricultural museums is presented in more detail in Russell H. Anderson, "A National Agricultural Center as a Focal Point," *Agricultural History*, 13:129–136 (July 1939). See also C. A. Browne, "A National Museum of Agriculture; The Story of a Lost Endeavor," *ibid.*, 137–148; and Clifford Lord, "The Farmers' Museum," *ibid.*, 17:167–171 (July 1943).

These museums depicting agriculture should be dynamic and not mere depositories. The objects collected and displayed must not be treated as relics but as illustrative material in a connected story. The important thing to emphasize is not the object but the trend of events, the causes, the relationships, and the consequences of which it was a part. Like the data in a book, the objects in museums must be synthesized and interpreted to emphasize definite purposes. Among other things, museums should show that agriculture is not only an industry but a way of life. For example, a cotton plantation of the ante-bellum period represented not only a system of farming but a social organization and a philosophy of life which was of vast importance in American political as well as economic life. The same may be said for the New England farm, the Middle Western farm, and the ranch on the Great Plains.

The museums of agriculture that project the subject on a national scale should depict the principal regions of the country historically by order of settlement, stages of agriculture, and types of farming, and currently by major crop and commodity interests. The following should be shown: (1) For the regions, the geographical features (physiography, soil, and climate), the flora and the fauna, the crops, the tools, the transportation, and the mode of life. (2) The state of the land at the time of settlement and its uses and abuses (erosion, decreased income, lower standards of living). (3) The techniques used to conserve and restore land. (4) The industrial and commercial organization involved in the production and distribution of farm products. (5) Current interests—the depiction of what the farmers, the stock and plant breeders, industrial laboratories, the agricultural colleges and experiment stations, the Department of Agriculture, and other agencies are doing that is of significance to the average citizen today. Examples: hybrid corn—what it is and its scientific explanation—what is being done with it—what benefits arise from it—what its probable future is; the cotton picker—the engineering difficulties—its relation to plant breeding—its social and economic implications; conservation—especially erosion control—the seriousness of the problem—what has been done in the past, and at present, both at home and abroad; and soybeans as a new crop—their history in America and their uses. Exhibits of this sort should be circularized throughout the country as temporary loans to other museums. In some cases, it might be possible also to use these exhibits as trailside museums in cooperation with the National Park Service.

Museums of agriculture should be visualized and operated as teaching institutions and extra-curricular schools. The main museum of agriculture should be the central agency in coordinating the work of other agricultural museums or agricultural departments of other museums throughout the country.

Museums of agriculture should utilize all worthwhile devices in presenting their story. (1) Indoors—life-size figures and machines; models, preferably operative; live plants; dioramas; motion pictures; photographs; charts; diagrams; actual demonstrations of processes. (2) Outdoors—museum exhibits in their natural settings can usually be arranged to produce effects that are impossible indoors. Examples: Pioneer cabins and other farm building groups; fences; large-scale machines; grist mills; etc. (3) Restorations of representative farm settings. Examples: Monticello and its farms where Jefferson projected and pioneered in many fields of agricultural science; the McCormick plantation in the Valley of Virginia where the reaper was invented; the Georgia plantation where Eli Whitney invented the cotton gin; the Oliver Hudson Kelley farm at Elk River, Minnesota, to represent the Middle Western farm home of the 1870s.

The materials and methods of a dynamic museum of agriculture should not supersede but assist the informational work of the Department of Agriculture and its correlative agencies.

The staff, and especially the directing head, should have the power of decision on subject matter and techniques. Its members should have understanding of the subject matter, training, and breadth of vision.

CONCLUSION

This prospectus is submitted with a view to stimulating further thought and action rather than for adoption as an official program. After all, the achievements of the Society during the next quarter century are dependent on the extent to which it is able, by virtue of its leadership and financial means, to extend its activities in any direction whatsoever. Therefore, the ideas and suggestions here delineated are, in essence, a challenge to the membership.